Pheidole in the New World

A DOMINANT, HYPERDIVERSE ANT GENUS

Edward O. Wilson

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Frontispiece: A reconstruction of the single known colony of *Pheidole nasutoides,* found at La Selva, Costa Rica. Painting by Katherine Brown-Wing

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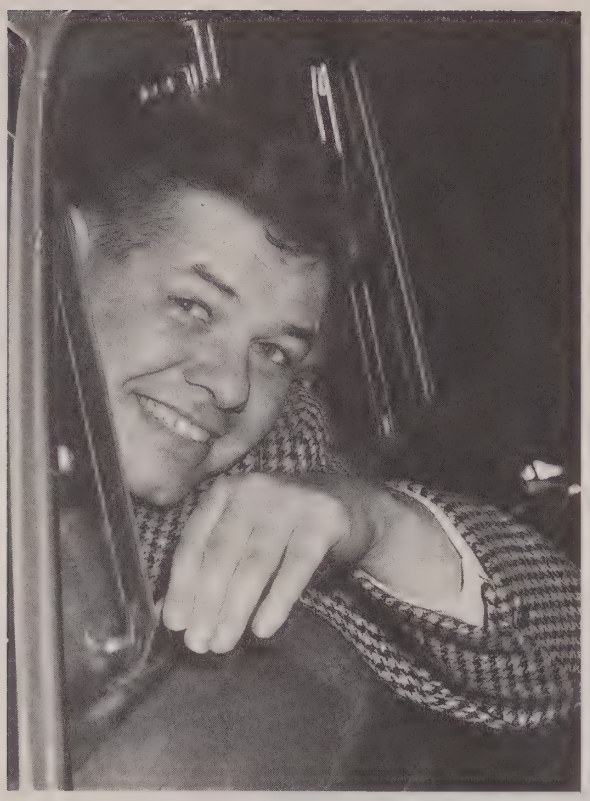
In Memory of William Louis Brown
(1922-1997)

William L. Brown Jr. at 30,
collecting at Ferntree Gully,
Dandenong Ranges, Australia, 1952.
(Courtesy of Doris E. Brown.)



Bill Brown at 39, Cornell, 1961. (Photo by Thomas Eisner.)

I knew Bill Brown for 50 years, and I've never met anyone else remotely like him. He was unique, and I don't think we'll ever see his like again, not just for the rareness of his character, but for the uniqueness of the time in which he lived and worked on his beloved ants. I've thought a lot about what made Bill different, what caused him to burn with such a pure inner light, and I've come up with this: the devotion to his art. His *art*. He was a scientist to the bone, a hard-core factual investigator, relentless for more information, skeptical in mood, all those things and yet . . . myrmecology, the study of ants, was an art form to him. It was the center of his creative life, and he was a very creative man. The passion he radiated about this subject turned younger people (we all seemed younger than Uncle Bill) into acolytes, into apprentices; and there was no prize the academic world could offer us more than a rare, measured compliment from the master, something like "Yeah, that's pretty good; that's really interesting."

Bill was my mentor. I first met him through correspondence in 1947, when I was 18, and had already taken my vows, so to speak, in ant taxonomy, just as he had been in contact with *his* mentor, William S. (Bill) Creighton, since he was 16. In natural history, addiction occurs early. In the summer of 1950, I rode a Greyhound Bus all the way from Mobile, Alabama, to Boston, and stayed with Bill and his wife, Doris, in their little apartment near Harvard, as they prepared to leave for Australia and momentous field research in that still myrmecologically underexplored continent. We worked in the Museum of Comparative Zoology ant collection together, and he gave me the kind of plain, sincere, egalitarian treatment he was to bestow on dozens of other students in his field in the decades to follow. He welcomed you, he treated you with respect, he stood in awe with you before the intricacy of the subject, he gladly taught and learned, he created a sense that here in this little discipline was something—to borrow from F. Scott Fitzgerald, the kind of writer Bill so admired—something commensurate to man's capacity for wonder. In 1950, he was 28 and I was 21, and the whole world seemed ours to possess.

Off he went to Australia, and in the years to follow just about every other place in the world where interesting ants are to be found, and he was often the first to do serious collecting in each. In time he became one of the most widely traveled naturalists of all time, bar none.

He was a key transitional figure in the history of myrmecology. From 1937, when William Morton Wheeler died, into the 1960s, there were very few researchers working on the classification and ecology of ants, and Bill carried the torch to close the gap. He played a major role in changing ant systematics from a thicket of trinomials and quadrinomials into a consistent binomial system based on the modern biological species concept. He was the first to recognize the major phyletic division of the myrmecioid and poneroid subfamily groups. He made judicious rearrangements of genera and tribes, "sank" innumerable worthless names into synonymy, and crafted clear, precise revisions widely through the Formicidae and most especially in his favorite groups, the Dacetini and Ponerinae.

His open, supportive nature drew young people in, and he played a major role in starting the current boom times in which hundreds are engaged in myrmecology around the world. We have truly followed in his footsteps.

Bill Brown was a working-class guy with a first-class mind and a noble heart. He had steel-hard integrity and his generosity to others knew no bounds. He hated a phony, to use one of his favorite words, could smell one a city block away, and put currency in only two things: solid accomplishment and integrity of purpose and representation. He never looked down on anybody socially and he never looked up to anybody. He was unimpressed by rank and status. He never played academic politics, never sought academic recognition or status, but instead waved aside compliments and put others first in research collaboration; he was a righteous man to the inner core.

Toward the end of his life we used to talk about his dream field trip: get into a rich rainforest, sit at a table with a pan and collecting materials, and have graduate students scour the surrounding woods for ant nests which they bring to him to sort, study, and preserve. Dig through some of the "juicy red logs" where ant diversity peaks. In March 1987, while he was still sufficiently vigorous, I invited him along on a field trip to La Selva, the Organization for Tropical Studies station in Costa Rica. I sat him down on a field chair with a table in front of him, and *I* was the graduate student, hustling the ant nests for him to go through; and we talked incessantly about the treasures we found. It was a glorious three days.

In his later years Bill filled the same role in myrmecology and among his wider circle of students and admirers as the grizzly bear plays in the conservation movement. You didn't see him very often, and some younger researchers never did, but it made you feel good just to know he was there. It made things seem right. Now that he's gone, a big gap has been opened up in our consciousness that will never be completely closed.

Bill at 64,
in the field at La Selva, Costa Rica,
March 1987.

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Pheidole in the New World

Introduction

Pheidole is among the largest of all genera of plants and animals. The number of its known species worldwide is now close to 900, and the actual number worldwide, with undescribed species added, could easily be 1500. *Pheidole* is also cosmopolitan: in the New World its species occur collectively from New England and Washington State south all the way to cool-temperate Argentina, and in the Old World from southern Europe to South Africa and China to Tasmania, thence east across the Pacific, where endemic species are found as far as Samoa. Over much of the range, and particularly in warmer climates, it is not only hyperdiverse but is among the dominant ant genera in numbers of colonies and workers, as well as in biomass.

In the present monograph I present the New World *Pheidole,* recognizing 624 species, with 337 new to science added to the 287 previously named, altogether representing 19 percent of the known ant species of the Western Hemisphere and somewhat more than 6 percent of the entire known world ant fauna.

In diversity *Pheidole* rivals the formicine genus *Camponotus,* the other hyperdiverse and cosmopolitan genus of ants. Which of the two, *Pheidole* or *Camponotus,* has the greater number of species will be a matter of cheerful corridor argument among myrmecologists for a while longer. In the meantime, at the risk of taxonomic chauvinism, I place my bet on *Pheidole,* at least for the New World. My reasons are as follows. Individual *Pheidole* workers of most species are far smaller in size than those of *Camponotus,* and their colonies are more often less populous and more difficult to find. In the present revision of the New World fauna, a disproportionate number of new species has turned up in the huge *flavens* group, whose workers are typically among the last encountered by collectors. At the time of Barry Bolton's census of the known ant fauna (1995a), published before I completed my study of the large collections assembled at the Museum of Comparative Zoology, the number of New World species described in *Pheidole* was 263 and that in *Camponotus* 301. In the present monograph the number of New World *Pheidole* has been more than doubled, to 624, by the combined discovery of new species and the elevation of old subspecies and varieties to species level. William P. MacKay (personal communication), in a partially completed revision of the New World *Camponotus,* estimates a total of about 400 described and undescribed species of that genus known to him in collections. Meanwhile, undescribed species of New World *Pheidole* were still pouring in to the Harvard collection as my own monograph went to press. A finding consistent with this prediction has been provided by Fowler (1993). In his meta-analysis of 195 published ground ant communities from the New World, including both named species and those separated only as unnamed morphospecies, *Pheidole* led all other genera in species numbers, and was especially more diverse in warm-temperate and tropical zones from 40 degrees latitude north to 30 degrees latitude south.

Meanwhile, in all of the Old World—Eurasia, Africa, Asia, and Australia combined—the count in Bolton's 1995 census was 282 species in *Pheidole* and 630 in *Camponotus*. This might seem an insurmountable margin in favor of *Camponotus,* and it may well hold. Yet intensive collecting in the tropical moist forests of Ghana recently yielded 11 new or indeterminate *Pheidole* (Belshaw and Bolton 1994b). Eguchi (1999, 2000, 2001) has recently added 26 new species from Borneo and one from Java. It will be interesting to compare the two genera as field exploration and species-level revisions proceed.

Pheidole is also everywhere an abundant and often the prevailing ant genus in most of the warm climates of the world, and especially so in the soil and ground litter. During my collecting trips through large parts of the United States, West Indies, Mexico, and Central and South America, I have generally found it to be among the several most abundant ant genera at ground level. Subjective estimates I made earlier of relative colony abundance in 14 localities in New Guinea, New Caledonia, Vanuatu, Fiji, and Sri Lanka place *Pheidole* first in 12 of the sites and seventh and eighth respectively in the other two (Wilson 1976d). Its heavy presence around most of the world extends across the full range of major habitats at lower elevations wherever ants occur, from tropical rainforests to grasslands and deserts.

The numerical dominance and hyperdiversity of *Pheidole,* combined with the year-round activity of its colonies during warm weather, make *Pheidole* an ideal focal or "indicial" group for the assessment of local biodiversity as a whole. At the most species-rich localities of the New World, for example Cuzco Amazónico near Puerto Maldonado in the Peruvian Amazon and the La Selva Biological Station in Costa Rica, the number of species found within several square kilometers exceeds 50. At the opposite extreme, as in

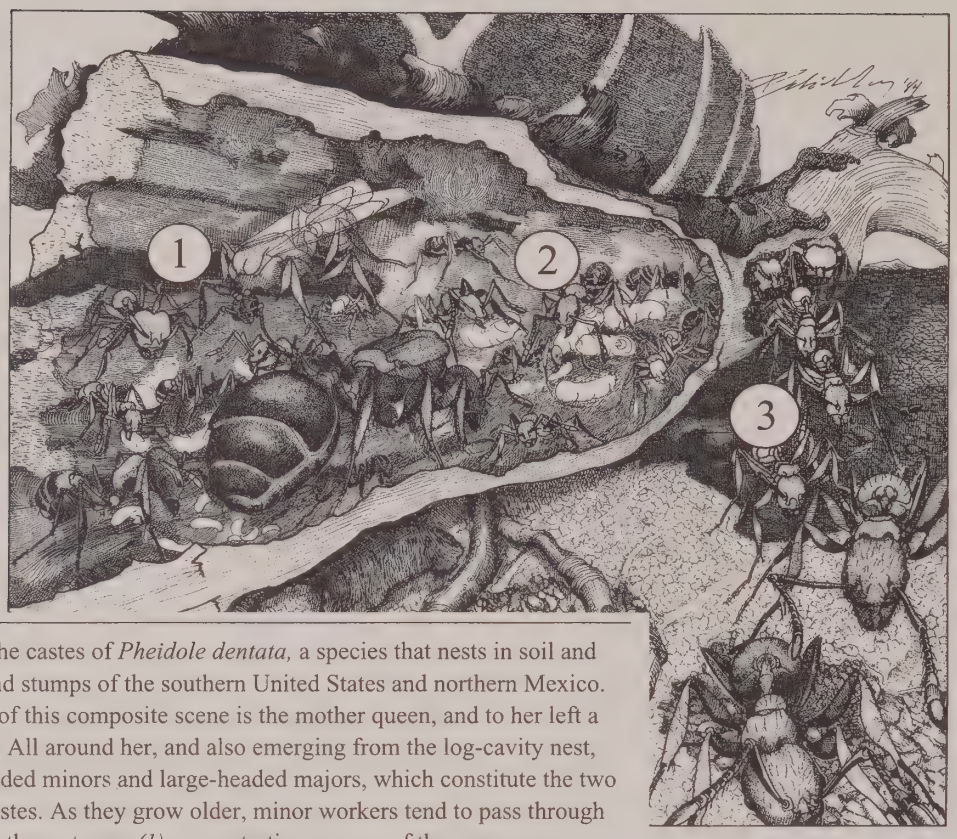


Figure 1 The castes of *Pheidole dentata,* a species that nests in soil and rotten logs and stumps of the southern United States and northern Mexico. In the center of this composite scene is the mother queen, and to her left a winged male. All around her, and also emerging from the log-cavity nest, are small-headed minors and large-headed majors, which constitute the two worker subcastes. As they grow older, minor workers tend to pass through the following three stages: *(1)* concentration on care of the queen, eggs, and pupae; *(2)* concentration on care of the larvae, as well as nest cleaning and repair and other quotidian tasks of the colony; and *(3)* foraging. (Drawing by Dmitry Schidlovsky, in Wilson 1985d.)

all environments of the Lesser Antilles, it is typically fewer than 5.

Furthermore, the facility with which the activity of *Pheidole* colonies can be observed in all but thick ground litter, and the relative ease with which they can be reared in laboratory nests, make them ideal for studies of ecology, behavior, and physiology—as evidenced by the many published studies reviewed in Hölldobler and Wilson (1990).

The usefulness of *Pheidole* for broad studies in biology makes it of potential interest not just to myrmecologists but to other scientists and naturalists. That is an important reason I have taken care during my studies to draw each species with mostly complete habitus viewed from several angles. For the same reason I have added "field marks," lines of the kind used in natural history field guides, to point to some of the principal diagnostic features.

Diagnosis and Subdivision of *Pheidole*

Almost all species of *Pheidole* are easily distinguished at a glance from all genera around it, another feature that makes it favorable for general studies. Its diagnostic traits can be compared with those of all other ant genera in the scanned electron micrographs in Barry Bolton's *Identification Guide to the Ant Genera of the World* (1994), as well as in the line drawings provided by Bert Hölldobler and me in *The Ants* (1990). They are briefly summarized as follows: *species of* Pheidole *are myrmicines; hence they possess a two-segmented waist, and in addition the antennal insertions and their covering frontal lobes are separated by the posteriorly extended median portion of the clypeus. Within the Myrmicinae the worker caste of* Pheidole *is divided into relatively slender minors and more robust, conspicuously large-headed majors, both of which and the queen possess 12-segmented antennae (rarely, 10- or 11-segmented) terminated by 3 thickened segments (rarely, 4 or 5) that form the antennal club*; see Figures 1, 2. This physical caste system is augmented, as in most ants, by a temporal caste system, in which the minors progress in modal preoccupation from nursing to house work and finally to foraging as they grow older; the sequence is depicted in Figure 1. (For a complete anatomical diagnosis of the subfamily Myrmicinae and keys to its genera, as well as tribal classification, see Bolton 1994: 8–11, 75–107.)

Figure 2 Colony defense by *Pheidole dentata* is organized with chemical alarm and recruitment by the minor workers and activation of the major workers. A typical defense force is shown here attacking red imported fire ants *(Solenopsis invicta).* *Pheidole* minor worker scouts, after contacting fire ant workers, run back and forth to the nest, dragging the tips of their abdomens over the ground to lay odor trails with a pheromone produced in the poison gland and paid out through the sting (see upper left). The trail pheromone attracts both minors and majors to the battlefield. In the ensuing action, the majors are especially effective in destroying the invaders, which they chop to pieces with their powerful, clipper-like mandibles. Some of the *Pheidole* are themselves crippled or killed by the venom of the fire ants. (Drawing by Sarah Landry, from Wilson 1976a.)

Six species of New World *Pheidole—hirtula, macclendoni, obtusospinosa, polymorpha, rhea,* and *tepicana*—possess an extra large supermajor subcaste in addition to the typically proportioned minor and major subcastes. This is a true third subcaste, which appears consistently in colonies as they grow in population.

A single specimen of a media, an intermediate form between minors and major, has turned up in the small available museum sample of *P. boruca.* The specimen may represent a developmental anomaly rather than a true persistent caste. In support of this interpretation is the observation by Naves (1985), who obtained medias in a laboratory colony of *Pheidole dentata* accidentally starved for three weeks.

A third variant of *Pheidole* worker, this one undoubtedly pathological in nature, is the "mermithergate," a minor-major intermediate diverted from normal development through infection by a nematode of the genus *Mermis.* The condition is rare. William M. Wheeler (1928b), on the basis of his own research and that of his predecessors, reported mermithergates in the Eurasian *pallidula* and in five New World species, *absurda, cephalotes, dentata, gouldi,* and *susannae.* I have since found another example in the type series of the new species *praeses.* The distinguishing trait is enlarged gastral segments and a typically distended gaster, within which the relatively huge nematodes (see Figure 3) can often be clearly seen. *Pheidole* mermithergates vary among species in head shape from that of a large minor to that of a small major, and they often possess a median ocellus as well.

In addition to the distinctive dimorphic or trimorphic worker caste system, all free-living species of *Pheidole* have reduced stings, so that during combat the workers rely on biting and the release of toxic and repellent chemicals. So far as is known in the small number of species whose communication systems have been studied, minor workers lay recruitment trails with pheromones manufactured and stored in the poison gland and paid out onto the ground through the sting.

The larvae of *Pheidole,* studied in detail by George C. and Jeanette Wheeler (1953b), are distinguished from those among related genera in the tribe Pheidolini by their chunky, subellipsoidal bodies; proportionately large head with a short neck perched on the ventral surface of the thorax; and relatively sparse hairs that are variously short and bifid (2-branched), long and bifid, or long and anchor-tipped, as illustrated in Figure 4.

As a first step in meeting the challenge of systematics in the New World *Pheidole,* I have divided the native species into 17 groups. Two other groups, centered on *megacephala*

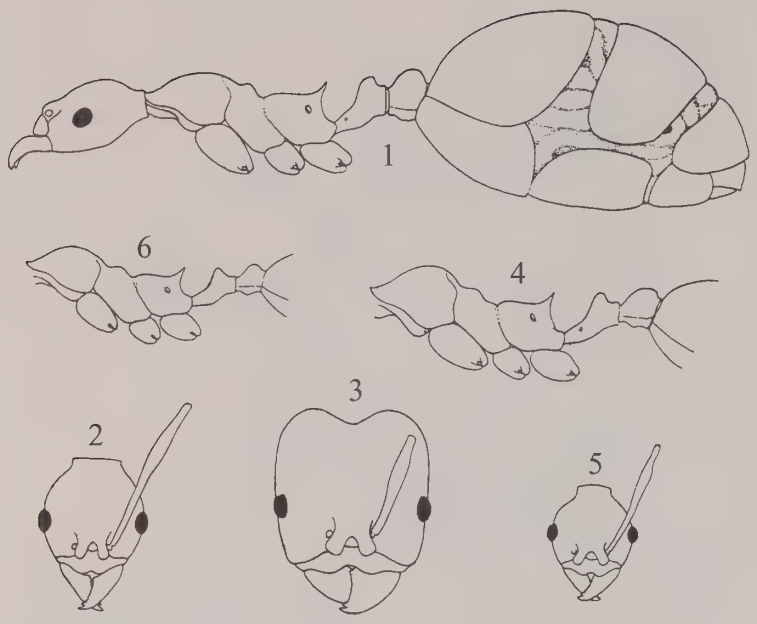


Figure 3 The normal worker castes of *Pheidole gouldi* are depicted in comparison with a mermithergate: side view of the body of a mermithergate, with the *Mermis* nematode visible through the intersegmental membranes of its gaster *(1)*; frontal view of the head of the mermithergate *(2)*; views of the head and body of a normal major *(3, 4)*; views of the head and body of a normal minor *(5, 6)*. (Adapted from W. M. Wheeler 1928b.)

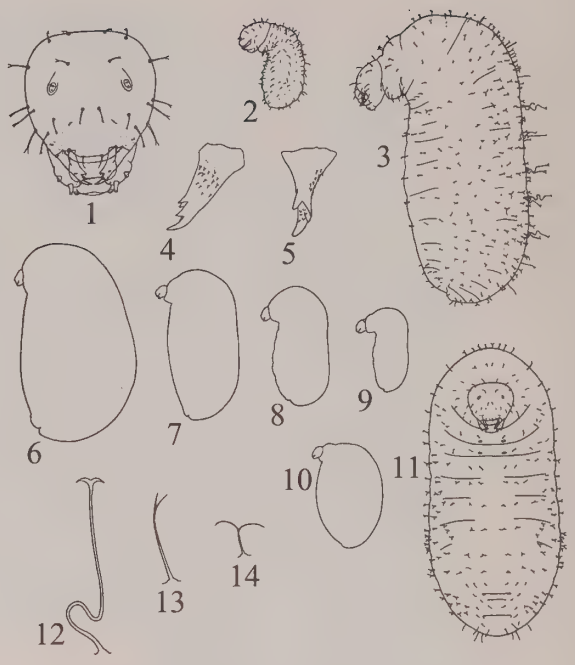


Figure 4 Larvae of *Pheidole dentata* of the southern United States and northern Mexico, showing frontal view of a minor larval head *(1)*; very young and mature minor larvae in side view *(2, 3)*; left mandible of minor worker larva in anterior and medial views *(4, 5)*; mature larvae variously of a queen *(6)*, male *(7)*, major *(8)*, and minor *(9)*; immature larva of sexual form *(10)*; mature minor larva in ventral view *(11)*; and anchor-tipped and bifid hairs of the body *(12–14)*. (Adapted from G. C. and J. Wheeler 1953b.)

and *teneriffana,* are Old World in origin, with each represented in the New World by a single introduced species. The groups are admittedly subjective and tenuous, being based solely on combinations of anatomical traits in the minor and major workers. This assessment does not yet include queens or males, the samples of which are still too sparse to allow firm comparisons. The informal classification moreover does not include molecular data or quantitative cladistic analysis. At this stage of work on the genus, with over 600 New World species now known and more continuing to accumulate in collections, a full-scale assault at these more advanced levels of analysis would be premature and an inefficient use of time and resources. I have instead chosen to lay a base at the species level, then propose informal species groups. The logical next stage is to enlarge the database with intensive collecting, natural history studies, and revisionary studies group by group as adequate study materials come to hand.

The defining traits of the 19 species groups are presented in the opening species-group key and in the lead paragraphs of the individual keys of each species group in turn. What I will present now is a brief overview of the New World *Pheidole* fauna as I understand it. As a reference base to the generalizations on natural history, I have summarized much of the available data on habitat and food preferences of the larger and better known groups in Table 1.

The great majority of species of the New World *Pheidole* fall into five major groups out of the 19 groups distinguished. I believe that each of these major groups is monophyletic, although, as I will document subsequently, intermediate and ambiguous species abound around their margins. The five groups can be characterized as follows:

The species of the ***diligens*** **group**, with 86 known species, have majors that for the most part are medium-sized, with heart-shaped heads; long antennal scapes; weak, nonreticulate

Table 1 The number of species in the larger species groups of New World *Pheidole* found in various habitats and known to be either granivorous or carnivorous or both, based on previous literature and unpublished field notes. The natural-history details from which these figures are compiled are given in the Biology sections of the individual species protocols.

SPECIES GROUP	TROPICAL FOREST: ARBOREAL	TROPICAL FOREST: GROUND	TEMPERATE FOREST	SCRUB FOREST OR SEMIDESERT	GRASSLANDS, SAVANNA, FOREST CLEARINGS, OR DISTURBED HABITATS	DESERT	GRANIVORE	CARNIVORE AND/OR SCAVENGER
biconstricta	—	3	—	—	—	—	—	1
crassicornis	—	—	6	1	6	1	1	—
diligens	6	36	—	—	10	1	—	5
fallax	5	30	3	4	15	4	3	11
flavens	19	77	12	2	11	—	4	5
pilifera	—	—	14	13	11	11	16	3
punctatissima	—	6	1	—	1	—	—	—
scrobifera	—	8	—	—	—	—	—	—
tristis	8	50	—	3	7	—	16	4

sculpturing; relatively sparse pilosity; and prominent mesonotal convexities. The species are exclusively Neotropical. They are primarily limited to tropical forests, where about one in six is also partly or wholly arboreal. One in six of all *diligens*-group species also lives in open environments, and several are successful in manmade environments. Only a single species, the pale-colored *noar* of the Dominican Republic, has been found in a desert environment. So far as is known, the species are exclusively predators and scavengers. None has been observed collecting seeds.

The second of the "big five" is the ***fallax* group**, with 103 known species. Its majors are typically medium to large in size and possess dense pilosity; strong sculpturing with at least some and often a great deal of reticulation; nearly parallel head margins; and relatively long antennal scapes. This assemblage rivals the *flavens* group in geographic distribution, with species ranging collectively from New York to Argentina. Most of the species occur in tropical forests where, like those of the *diligens* group, about one in six is also partly or wholly arboreal. But a large minority inhabit open habitats, from scrub and grassland to desert, and several thrive in manmade environments. The members of the *fallax* group are primarily predators and scavengers, but a small number also collect seeds, apparently as a secondary food source.

The species of the ***flavens* group**, with 165 known species, are distinguished in both the major and minor subcastes by their small size, short antennal scapes, and vestigial or absent mesonotal convexities. By far the largest of the assemblages in numbers of species, they also come close to matching the *fallax* group in breadth of geographical distribution, ranging collectively from the mid-Atlantic United States to Argentina. Their headquarters are the tropical forests of Central and South America, where about a fourth of the species are also mostly or entirely arboreal. A substantial number of the species occur in warm-temperate and subtropical forests, especially in the southern hemisphere. A few inhabit grassland and other open environments. Their food habits are poorly known, but it is likely that most or all are predators and scavengers. Collectors opening the nests of large numbers of the species have so far encountered only several with seed caches or chaff piles that indicate granivory.

The ***pilifera* group**, with 48 known species, is the smallest group of the big five. It is distinguished by the combination of reduced hypostomal teeth number (0 or 2) in the major, by the unusually large eyes of the minor of most species, and, in both major and minor, by a quadrate head shape and short antennal scapes. The species of the *pilifera* group are almost entirely Nearctic, that is, limited to North America and the Mexican plateau. One outlier species *(yucatana)* is found on the nearby Yucatán peninsula. *Pilifera*-group species are primarily adapted to xeric environments, from scrub to grassland to desert, and even the forest-dwelling species occur almost entirely in open forests or clearings. While most or all of the species may be predators or scavengers of arthropods, a remarkably high 85 percent of those for which data are available also collect seeds, and the practice may eventually prove to be universal. Adaptive radiation within the group is considerable, its products including extreme desert dwellers such as *barbata* and *psammophila* and a large species, *titanis,* that is a specialist predator on termites.

The ***tristis* group**, with 132 known species, is an ensemble of exclusively Neotropical species that range collectively from the Bahamas and southern Mexico to Argentina, with its headquarters in the tropical Andes. The species are medium to large in size with short antennal scapes in the major and small, posteriorly set eyes in the minor, and a reduced or absent mesonotal convexity in both subcastes. *Tristis*-group species are primarily forest dwellers, and about one in six is also partly or wholly arboreal. A high percentage collect and store seeds in their nests. The majors of about a third of the species have distinctive hornlike protrusions on the anterior front of their heads. In general, *tristis*-group majors tend to be few in number compared to the minors and timid in behavior. Perhaps these traits reflect a specialization on seed milling and participation in defense only when combat occurs either inside or close to the nest.

As Barry Bolton documents in *A New General Catalogue of the Ants of the World, Pheidole* has in the past been sporadically divided into subgenera. At the present time these taxa are in synonymy, but their names remain available should *Pheidole* be sundered into two or more full genera in the future. The subgenera of the New World together with full genera submerged as junior synonyms are listed below. I have also provided their relation to the species groups as conceived in the present monograph.

Pheidole (Pheidole) Westwood 1839a. Type species: *Atta providens* Sykes 1835 of India, placed in the newly erected genus *Pheidole* by Westwood in 1839a. This "typical" subgenus of the world *Pheidole,* if distinguished from the other subgenera, would embrace the following species groups recognized by me*: biconstricta, crassicornis, diligens, distorta, fallax, flavens, gertrudae, lamia, megacephala, pilifera, punctatissima, teneriffana,* and *tristis*.

Bruchomyrma Santschi 1922e. Type species: *acutidens,* a parasitic member of the *fallax* group of *Pheidole* as presently delimited.

Cephalomorium Forel 1922b, described as a subgenus of *Tetramorium,* placed in *Hendecapheidole* (see below) by Santschi (1925d). Type species: *bahai*.

Pheidole (Ceratopheidole) Pergande 1896. Type species: *granulata*. The same as the *granulata* group now conceived.

Pheidole (Decapheidole) Forel 1912g. Type species: *perpusilla*. The same as the *perpusilla* group now conceived.

Gallardomyrma Bruch 1932. Type species: *argentina,* a parasitic member of the *diligens* group as now conceived.

Hendecapheidole W. M. Wheeler 1922f. Type species: *tachigaliae,* a member of the *tachigaliae* group as now conceived. A senior synonym of *Cephalomorium,* listed above.

Scrobopheidole Emery 1915g. Type species: *scrobifera,* a member of the *scrobifera* group as now conceived.

Sympheidole W. M. Wheeler 1904a. Type species *elecebra,* a parasitic member of the *pilifera* group as now conceived.

Trachypheidole Emery 1915g. Type species: *bicornis,* a member of the *transversostriata* group as now conceived.

In addition to the big-five species groups *(diligens, fallax, flavens, pilifera, tristis),* the remaining twelve groups native to the New World are also considered to be independently monophyletic, with two exceptions. The first polyphyletic assemblage is the *transversostriata* group, which appears to comprise two lines evolved from within the *flavens* group; one line leads to the arboricolous *bicornis,* an obligatory symbiont of the myrmecophyte understory tree *Piper,* and the other line to four ground-dwelling species, *gnomus, scalaris, scolioceps,* and *transversostriata*. I have placed the five together solely as a temporary convenience for identification, in order to make use of the strikingly transverse, ladder-like carinulation of the head. The same rationale for temporary polyphyletic clustering is used in the case of the species of the *granulata* group, in order to make use of their rare and distinctive 4-segmented antennal club. The species acquiring this trait appear to have sprung variously from no fewer than three species groups, *fallax, pilifera*, and *tristis*. Their probable relationships are discussed in the species descriptions.

Adaptive Radiation

The 624 known species of the New World have achieved an astonishing magnitude of anatomical variation and adaptation. The only major niches they have failed to enter are fungus-growing, slave-making, mass raiding in the army-ant manner, and predation on *Pheidole* or other genera of ants. Also, while a few of the species are known to visit extrafloral nectaries, and one *(rhinoceros)* has been observed attending homopterans, no species is yet known to depend on homopteran or butterfly larval secretions for food. The remaining adaptations among individual species are nevertheless widespread, in some cases reaching extremes, as the following examples will illustrate.

- In tropical forests, a large minority of species in the *diligens, fallax, flavens,* and *tristis* groups, as well as *bicornis* in the *transversostriata* group and *tachigaliae* in the *tachigaliae* group, are partly or wholly arboreal (see Table 1). Within that zone the nest sites vary greatly. One niche occupied by *bilimeki,* for example, is the "trash basket" formed by the frond bases of spiny palms in the

understory of tropical forests. The tiny species *christopherseni* prefers hollow live stems, while *fiorii* and *violacea* construct "ant gardens," carton nests affixed to stems and broad leaves that serve as substrata for the growth of masses of small epiphytes. At all levels, up to and including the high canopy, other species nest variously in decaying branches and in epiphyte mats. This niche appears not to require a high level of specialization, since the arrangements and microclimates of litter and humus are at least somewhat comparable to those on the ground, and especially so in montane rainforests where the ambient humidity remains very high most or all of the year. A few species are specialized inhabitants of myrmecophytes, in other words ant plants offering domatia, or food, or both, that favor ant inhabitants. In particular, *bicornis* of the *transversostriata* group lives exclusively in *Piper,* while *tachigaliae* of the *tachigaliae* group and *melastomae* and *minutula* of the *flavens* group occupy *Tachigalia. Pheidole cramptoni* is a facultative inhabitant of both *Cordia* and *Piper*.

The data available now make the pattern of colonization of the arboreal zone by New World *Pheidole* relatively clear, as follows. Colonization has not been achieved by one or a few species that invaded the zone like an island above the ground and then radiated into multiple species to fill the open niches awaiting them. Instead, the arboreal zone has been penetrated independently by large numbers of species belonging variously to at least a third of the New World species groups. As a result, the colonists vary strikingly among themselves in size, anatomy, and habits in ways that reflect their respective independent origins rather than an arboreal adaptive radiation with common plesiomorphic traits.

- The anatomical variation of species across and within the 19 species groups reflects in part strong differences in habitat and daily activity cycle. The exceptionally large eyes of some members of the *flavens* and *pilifera* groups and the very pale coloration of desert and scrubland species such as *ariel* and *noar* are evidently associated with nocturnal, epigaeic foraging. At the opposite extreme, the tiny eyes of the minor workers of *fimbriata* and *microps* may be adaptations to subterranean foraging. Two species, *barbata* and *psammophila,* which inhabit extreme desert environments of the southwestern United States, have psammophores, arrays of long curving hairs which together form a basket-like structure on the ventral surface of the head. These organs are evolutionarily convergent to the psammophores of the desert-dwelling species of *Messor* and *Pogonomyrmex,* which use them to carry sand during nest excavation.
- A few species are specialized for life in extreme physical environments, where the number of competitors is greatly reduced. *Pheidole psammophila* nests and forages in the shifting sands of the Sonoran Desert, in places so unstable as to support only a small set of xerophilic competitors in *Dorymyrmex, Myrmecocystus,* and *Pogonomyrmex* (Stefan Cover, personal communication). *P. clydei,* an inhabitant of stony desert terrain from New Mexico to southern California, differs from other described species of New World *Pheidole* by its preference for nesting in the crevices of rock walls and giant boulders. Recently, Cover (personal communication) has discovered that two more species (*portalensis,* described in this monograph, and a third, still undescribed species) also appear to be rock-wall specialists. Through large portions of the West Indies and South America, *P. jelskii* flourishes as a dominant insect by building its nest on marine and riverine beaches and the bare, hot soil of agricultural fields and pastures.
- Some of the smallest species of *Pheidole* may live inside or upon the nests of larger social insects. The newly discovered *P. dinophila* of Brazil, for example, has been encountered only inside nests of the giant ponerine ant *Dinoponera australis.* A similarly tiny member of the *flavens* group, *P. rudigenis,* lives at least adventitiously in the same environment. *P. calens,* a Mexican member of the *pilifera* group, apparently nests exclusively on the crater mounds of the much larger *Pogonomyrmex* harvester ants, while in the United States *P. creightoni,* also in the *pilifera* group, frequently builds its nests on the mounds of the harvester *Messor andrei.* Similar records, only suggestive because they are based on single collections, have been made of *P. atticola,* found in a nest of the leafcutter ant *Acromyrmex lundii,* and *cavifrons, mittermeieri, perpusilla,* and *termitobia,* which are known from single series taken in termite nests.
- As depicted in the frontispiece illustration, the rare arboricolous *Pheidole nasutoides* appears to mimic the formidable soldiers of the termite genus *Nasutitermes* in both appearance and behavior. Another *Pheidole* species oddly colored in the same way is *taurus* of Argentina, but since the species is known from only a single museum series, with no field notes, the suggestion of mimicry is at best a weak hypothesis. A perhaps stronger case can be made for *macromischoides* of Cuba, known from a single collection I made in Cuba in July 1953. The resemblance of the minor workers to certain of the endemic Cuban *Leptothorax (= Macromischa)* was so close I took them for another species of *Leptothorax,* and did not recognize my mistake for more than 30 years! In the present monograph I describe two other Cuban species in the same complex, *alayoi* and *naylae*. The ecological relation of these *Pheidole* to *Leptothorax,* if any, is an interesting puzzle of Cuban entomology awaiting investigation in the field.

Table 2 Examples of convergent evolution within the New World *Pheidole*.

DERIVED CHARACTER STATE	SPECIES GROUPS IN WHICH THE CHARACTER STATE APPEARS AS A DERIVED CHARACTER STATE
4-jointed antennal club	*granulata* s. str., *fallax, pilifera,* and *tristis* groups
Broadening and flattering of antennal scape base	*crassicornis, diligens,* and *fallax* groups
Extremely large size	*fallax, pilifera,* and *tristis* groups
Antennal scrobes	*flavens, scrobifera,* and *tristis* groups
Loss of propodeal spines	*biconstricta, diligens, fallax, flavens,* and *gertrudae* groups
Supermajor	*fallax and pilifera* groups

The most extensive anatomical variation within *Pheidole* is in the head of the major workers. A gallery of the most aberrant forms is provided in Figure 5. The various roles of these modifications remain entirely unknown in the vast majority of species, but the following tentative generalizations can be made from the existing fragments of information we do have. Majors either defend the nest and food finds outside the nest, or mill seeds, or both. Those that specialize heavily on milling seeds tend to be much larger than the minors and fewer in number. They are the most divergent in anatomy from the minors, especially in the head structure, and those of some species never leave the nest. In a few of the extreme exemplars of this trend, found for example in the *tristis* group, it is surprising to observe that the majors, even though still called "soldiers" in some of the literature, retreat in cowardly manner into deeper galleries when the nest is disturbed. For the colony's sake, however, timidity may be the preferred behavior. Such majors are not only few in number but also, because of their large size, energetically expensive to replace.

In contrast, majors of *Pheidole* species that are primarily or exclusively scavengers and predators tend to be smaller in size relative to the minors than is the case with granivores. They are also more numerous and less divergent in overall anatomy. They leave the nest readily to defend its perimeter and accompany minors to protect large insects and other food objects too bulky to be transported home by single minors.

On the Coherence of *Pheidole*

Is "hyperdiversity" in *Pheidole* an artifact? The limits of each genus of animals and plants is, after all, a contrivance of higher classification, a means of grouping similar species into a single packet of common ancestry, in order both to reflect their origins and to speed identification. If *Pheidole,* the giant aggregate now conceived in the present monograph, could be split evenly into, say, ten genera, each of the resulting fragments would represent a genus still moderately large in comparison with other ant genera but not so large as to be called hyperdiverse.

Pheidole may be split in the future, and perhaps drastically, when collections are more complete and molecular and cladistic analyses are available, but to do so now would be reckless and almost certainly result in nomenclatural tangles with each successive refinement in phylogeny. *Pheidole* today is like a large diamond set on the bench mount of a gem cutter. To cleave it before seeing clearly into its interior could be disastrous.

Meanwhile, as a more objective criterion of hyperdiversity, consider that the species of *Pheidole* are tightly packed, at least with reference to the external anatomical traits visible at moderate magnification. Still another logical criterion met is the history of repeated radiations within the larger species groups, hence secondary radiations with reference to *Pheidole* as a whole. And below that level there have been tertiary speciation episodes that created ensembles of closely similar species, such as the *bicarinata* and *californica* complexes within the *pilifera* group, and the *guilelmimuelleri* and *subarmata* complexes within the *tristis* group.

One consequence of this exuberance of evolution is the frequent convergence in character traits between species groups, a phenomenon I have documented in Table 2. Another is the existence of species intermediate in the diagnostic traits defining the species groups, some of which are listed in Table 3. Finally, even the more extreme traits of a few notable species are linked by morphoclines that proceed by steps in intermediate species to other, more ordinary members of *Pheidole*. Examples include *P. walkeri,* a member of the *tristis* group that displays a weak form of the anterior phragmosis distinguishing the majors of the *lamia* group (as for example, *colobopsis* in Figure 5). The unique posterior phragmosis of the *setsukoae* major is prefigured by the broadening and coarse sculpturing of the occiput in two other *pilifera*-group members, *creightoni* and *hoplitica*. The bizarrely bent, slender petiole of *camptostela,* a *diligens*-group member, has an advanced precursor in *cyrtostela*. A finely graduated morphocline between two species groups is

Table 3 Species that are intermediate in multiple traits between species groups.

INTERMEDIATE SPECIES	SPECIES GROUPS LINKED BY THE INTERMEDIATE SPECIES
aenescens, chrysops, midas	*diligens* to *fallax* groups
carapuna complex and *pidax*	*flavens* to *tristis* groups
cerina, citrina, grex, onyx	*flavens* to *punctatissima* groups
coracina, erethizon	*crassicornis* to *fallax* groups
rhea, sciophila	*fallax* to *pilifera* groups

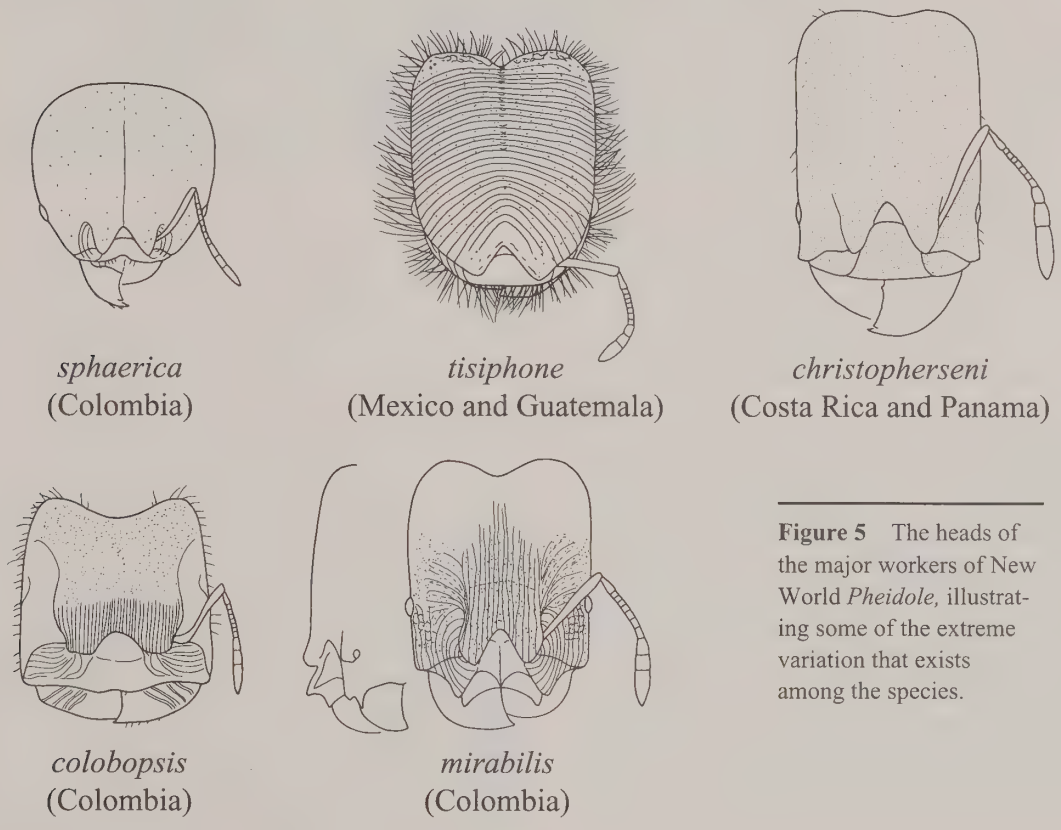


Figure 5 The heads of the major workers of New World *Pheidole,* illustrating some of the extreme variation that exists among the species.

seen in the major head shape of *pullula,* placed here in the *tristis* group, followed by the more advanced form of *subaberrans,* placed in the *aberrans* group, and culminated by the full assembly of advanced *aberrans*-group members. Finally, the strange balloon-shaped head of the *sphaerica* major (see Figure 5) is approached in steps within the *tristis* group by the progression from *rotundiceps* to *subsphaerica* to *pepo,* thence finally to *sphaerica.*

The Old World Species

I have made no attempt to define and collate the Old World species groups of *Pheidole* with those of the New World. In scanning the individual species, I have thought that most could be placed comfortably within the New World species groups as loosely defined in this monograph. A few, notably the *roosevelti* group (subgenus *Electropheidole*) and the *sexspinosa* group (subgenus *Pheidolacanthinus*), are certainly distinct at the species-group level, but others display arrays of traits that could be called "ordinary *Pheidole,*" that is, traits shared with many species in the more speciose of the New world assemblages, especially the *fallax, flavens,* and *tristis* groups. The Old World species have produced neither diverse and extreme forms in the major caste, such as those defining the *aberrans, distorta, granulata, lamia, scrobifera,* and *transversostriata* groups, nor very small species with the reduced antennal segmentation used to separate the *perpusilla* and *tachigaliae* groups. From the little we know of the natural history of Old World *Pheidole,* there is at yet no evidence of

Table 4 Chromosome numbers (2n) of *Pheidole* species in the New and Old Worlds.

SPECIES	SPECIES GROUP	SAMPLE ORIGIN	CHROMOSOME NUMBER (2N)	REFERENCE
desertorum	*fallax* group	southwestern U. S.	20	Taber and Cokendolpher (1988)
fallax (probably *jelskii*—EOW)	*fallax* group	Uruguay	20	Goñi et al. (1984)
hyatti	*fallax* group	southwestern U. S.	20	Taber and Cokendolpher (1988)
nitidula (= strobili)	*fallax* group	Uruguay	20	Goñi et al. (1984)
porcula	*crassicornis* group	southwestern U. S.	20	Taber and Cokendolpher (1988)
soritis	*pilifera* group	southwestern U. S.	18	Taber and Cokendolpher (1988)
tepicana	*pilifera* group	southwestern U. S.	18	Taber and Cokendolpher (1988)
spininodis	*tristis* group	Uruguay	20	Goñi et al. (1984)
subarmata (= cornutula)	*tristis* group	Uruguay	20	Goñi et al. (1984)
mus	not established	India	12	Imai et al. (1984)
woodmasoni	not established	India	18	Imai et al. (1984)
indica	not established	India	20	Imai et al. (1984)
sp. near *watsoni*	not established	India	28	Imai et al. (1984)
"sp. 5"	not established	India	30	Imai et al. (1984)
latinoda	not established	India	42	Imai et al. (1984)

the advanced ecological and behavioral adaptations that so strikingly distinguish some New World species, such as coevolution with myrmecophytes, psammophore sand excavation, commensalism, mimicry, and food specialization. However, in the absence of intensive collecting and natural-history studies in most of the Old World fauna, such comparisons must be stated very gingerly.

In general (and again, very tentatively!), the Old World faunas appear to have undergone much less adaptive radiation than those in the New World, and they appear to comprise fewer species.

Origins

It is tempting to conclude from the evident greater diversity in anatomy among the native *Pheidole* species that the New World was the cradle of the genus. But caution is needed here also, due to the opposite trend in chromosome numbers, at least as evidenced by counts made to date. As displayed in Table 4, the 2n of seven species so far counted in the New World and distributed through the *crassicornis, fallax,* and *tristis* groups, is 20; in two species in the *pilifera* group, it is 18. This narrow range is in notable contrast to the variation in six Old World species, all from India, in which 2n is variously 12, 18, 20, 28, 30, and 42; a list is given in Table 4.

On the geographical origin of *Pheidole* the fossil record is suggestive but again far from conclusive. The earliest known fossils are two winged queens of *Pheidole tertiaria* found in the Florissant shales of Colorado, which are early Oligocene in age (Carpenter 1930; M. V. H. Wilson 1978; Burnham 1979). These individuals are not well enough preserved to place to species group, but their size, indicated by a head width of about 1.4 mm, is medium-range for modern *Pheidole* species, outside the ranges of extant members of the *flavens* group but within the ranges of most of the other New World species groups. With the exception of one dubious record, to be mentioned shortly, *Pheidole* is absent from the Baltic amber, which is Oligocene and most likely early Oligocene in age (Burnham 1979). The absence of *Pheidole* in this ancient tropical European deposit is probably significant, first because the fauna of the Baltic amber is otherwise very similar to that of the Florissant shales at the tribal and generic level, and second because of the huge sample of specimens available, comprising an accumulated total of 11,678 ants, in the Baltic amber studies in separate lots by Mayr (1868c), André (1895b), and Wheeler (1915i). These analyses yielded a total of 92 species in 43 genera. As in the Florissant shales, whose ants comprise 5,594 specimens sorted by Carpenter to 32 species in 20 genera, all the species are extinct (or at least cannot be matched precisely to modern species). A small majority of genera are likewise extinct. One species of *Pheidole, P. cordata,* said to be from the Baltic amber, was described by Schweigger in 1819 and named by Holl in 1829. Schweigger's figure of a major worker, placed among other curiosities that include a

Figure 6 A major worker and a fragment of a minor worker of an unnamed species of the *flavens* group, found in the Dominican amber. (Specimen owned by Elizabeth J. Romans; photograph by Frank M. Carpenter.)

scorpion, a spider, and two small leaves, is an undoubted *Pheidole,* even though it is too poorly drawn to be compared with any other known species. More important, however, is its doubtful provenance. We need to ask how likely it was that the one ant chosen by Schweigger from the Baltic amber would belong to a genus absent from the 11,678 ants in the samples studied by Mayr, André, and Wheeler. I believe it more likely that Schweigger possessed a modern species embedded in fake amber or in copal.

By the time of the deposit of the Dominican Republic amber, in the early to middle Miocene, or 15–20 million years ago (Iturralde-Vinent and MacPhee 1996), *Pheidole* was well established. It lived in the midst of a rich ant fauna containing 45 known ant genera, only 3 of which are extinct today and 30 of which still live on Hispaniola, that is, in the combined countries of Haiti and the Dominican Republic (Wilson 1985e, 1988b; Baroni Urbani 1995). In this assemblage, *Pheidole* is relatively uncommon. Among many thousands of ants from the Dominican deposits I have examined in the Harvard collection and other sources that I assembled over many years, plus an additional major collection gleaned by Cesare Baroni Urbani in the Staatliches Museum für Naturkunde, Stuttgart, and by George O. Poinar, Jr., from his own large personal collection, I have been able to identify a total of 22 minors and majors of *Pheidole.* Eighteen of these are small ants in or close to the *flavens* group, together constituting one or at most several species (see Figure 6). In addition, I have seen 4 specimens of spinose minor workers belonging to *Pheidole tathepa,* a species described in one of my earlier reports (Wilson 1985a). Since that time Baroni Urbani (1995) has described a closely related species, *P. primigenia,* from 3 other specimens in the Dominican amber (see Figure 7). He has argued in considerable detail and persuasively that *tethepa* and *primigenia* are members of the *sexspinosa* group ("subgenus *Pheidolacanthinus*"), now restricted to the Old World, and in particular to tropical Asia, northeastern Australia, Melanesia, and western Polynesia. This surprising conclusion is supported by Baroni Urbani's (1980d) earlier discovery in Dominican amber of a species of the dolichoderine genus *Leptomyrmex, L. neotropicus,* which I—believing such an extreme biogeographic disjunction to be impossible! —erroneously transferred to *Camponotus* (Wilson 1985c) but later confirmed to be a *Leptomyrmex* (in Baroni Urbani and Wilson 1987). It is to be hoped that as more material of *tathepa* and *primigenia* comes to light, and perhaps of other species in the same group, the status and biogeographic interpretation can be still more firmly established.

Thus the *Pheidole* fauna of the Dominican Miocene appears to have been not only sparse in numbers of individual ants but also relatively poor in diversity. How does this compare with the fauna of the Old World Miocene? Unfortunately, the fossil record is too skimpy to draw any conclusion whatever, positive or negative. The 60 species of ants described by Heer (1849, 1867) from the Oeningen beds in Germany and the Radoboj formation in Croatia do not include specimens identified as *Pheidole,* but his generic concepts are questionable and in any case the types have been lost. Sicilian amber specimens of Miocene age described by Emery (1891b) do not include *Pheidole,* but the sample is so

Figure 7 The holotype of *Pheidole primigenia,* an extinct species from the Miocene amber of the Dominican Republic and a member of the *sexspinosa* group, in present times limited to the Indo-Australian region (from Baroni Urbani 1995; drawing by Armin Coray.)

small, comprising only 39 specimens belonging to 14 species, as to render the absence of *Pheidole* or any other genus meaningless.

Finally, the phylogenetic origins of *Pheidole* overall and the phylogeny of the 19 New World species groups also remain obscure. *Pheidole* has been placed as the nominal genus within the tribe Pheidolini, whose extant assemblage comprises *Aphaenogaster, Chimaeridris, Goniomma, Huberia, Kartidris, Lophomyrmex, Messor, Ocymyrmex, Oxyopomyrmex,* and *Pheidole,* and whose fossil forms include *Paraphaenogaster* of the Russian and Chinese Miocene and possibly also the obscure and probably indecipherable *Lonchomyrmex* of the Croatian Miocene (placements by Bolton 1995b). A genus-level phylogeny of the Pheidolini and the position of *Pheidole* within it awaits thorough cladistic and probably also comparative base-pair sequencing, as well as a respectable and badly needed revision of the Old World *Pheidole*. Meanwhile, one promising candidate for a sister group of *Pheidole* is the cosmopolitan genus *Aphaenogaster,* whose worker, except for the lack of an antennal club, bears a close overall resemblance to some *Pheidole* minor workers, minus the presence of an antennal club. Another candidate is *Chimaeridris,* consisting of two very rare Indonesian species. Its tiny workers resemble minors of the *Pheidole flavens* group, complete with 3-jointed antennal club, but with sickle-shaped mandibles unlike anything else within the Pheidolini.

The Origins of Hyperdiversity

Strong variation in species richness among genera, families, and still higher taxa is a universal but still poorly understood biological phenomenon. Its signature is the hollow curve distribution, first constructed in 1922 by the botanist J. C. Willis and refined by many investigators subsequently.

The hollow curve distribution is drawn from taxonomic data through the following steps. Take an assemblage of higher taxa sharing a common phylogenetic origin, such as a group of genera or a group of families. Count the number of units composing each taxon, such as the number of species in each genus or the number of genera (or species) in each family. For example, within the family Formicidae, comprising all the ants of the world, Bolton (1995a) recognized 296 genera comprising 9,538 species. When the genera are rank ordered according to the numbers of species each contains (i.e., *Camponotus* with 931 species, then *Pheidole* with 525, *Polyrhachis* with 477, *Crematogaster* with 427, *Tetramorium* with 415, and so on downward), and these numbers are represented in a histogram, the result is an approximation of a hollow curve. The hollow curve distribution for the New World ant genera, a subset of the world fauna, is provided in Figure 8.

When a genus or family at or near the top also contains exceptionally large numbers of species with reference to plant and animal diversity as a whole, say into the hundreds of species, it can reasonably be called "extremely dominant" or "overdominant" or, to use the more descriptively precise term I have employed in this monograph, hyperdiverse. Hyperdiverse genera among plants are *Rhododendron* with 1,200 species and *Erica* with 700; among beetles, the weevil genus *Apion* with 1,100, the staphylinid beetle genus *Stenus* with 1,400, and the scarab genus *Onthophagus* (possibly the largest animal genus of all) with over 1500; and among Hymenoptera, the ant genera *Camponotus* and *Pheidole,* each containing well over 1,000 species.

Hollow curve distributions, including those with taxa rich enough to be called hyperdiverse, are not artifacts of particular taxonomic schemes. Nor are they the outcome of the random birth and extinction of species through geologic time. Rather, they are truly biological and thus far more promising for scientific study. This conclusion was confirmed in an important analysis by Dial and Marzluff (1989). Of 85 real (not modeled) taxonomic assemblages they reviewed that had been published by previous authors, 53 had been classified by traditional schemes, in which species with common "diagnostic" traits are clustered into genera or families on the basis of presumed common ancestry and the amount of evolution that has occurred in the various lines thus distinguished. The remaining 32 assemblages had been classified by strict phylogenetic schemes, in which the genera or families represent clades, or groups inferred by minimal path analysis or quantitative phenetic similarity to have a common ultimate origin from a single branching point. The distinction between the two sets of assemblages was drawn from the evaluation of systematic practice by Raikow (1985).

Dial and Marzluff next derived hollow curve distributions from the data of the 85 empirical assemblages and matched them against distributions based on the following four independent models of random process: (1) The Poisson distribution, the first model, assumes that diversification within the group, hence the rank-ordered curve of comparative species or genus numbers, is simply a random property of the group. (2) A second model assumes a rank-ordered distribution originating when species formation and extinction occurred randomly throughout the evolutionary history of the group. (3) The MacArthur broken-stick hypothesis, generating the third distribution, assumes that each genus (or family) garners resources *simultaneously* and randomly, and that the number of species in a genus, or species and genera in a family, corresponds to the resources each such unit controls. (4) Finally, the canonical log-normal model assumes that the resources, hence the number of species or genera based on them, are *sequentially* subdivided among the evolving groups.

In each of the 85 real groups, the most diverse genus or family was significantly more so than predicted by any of the four models. Moreover, the dominant unit—the most diverse genus or family within the assemblage—contained on average 37 percent of the subunits, i.e., species or genera, in the traditionally constructed higher classifications, and they contained 39 percent of the subunits in the phylogenetic classifications. Hence the two approaches used by taxonomists were virtually identical in estimating the size of the dominant unit. Dial and Marzluff concluded that taxonomic dominance by one unit is not only a general but also a nonrandom feature of standing biodiversity.

Hyperdiversity can be recognized as a useful additional distinction when the genus or other higher category typified by *Pheidole* is extremely large with reference to all plants and animals. It is also heuristic in its extreme expression of the

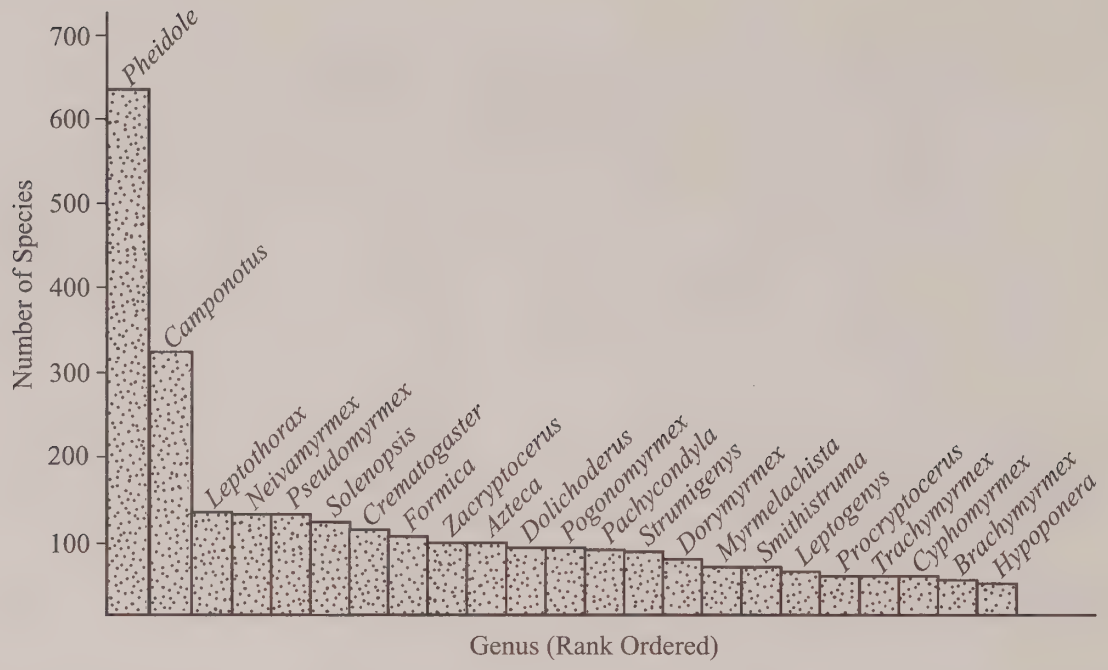


Figure 8 The hollow curve distribution of the 23 most speciose living New World ant genera, based on the census by Bolton (1995a) with the addition of the 337 new species of *Pheidole* described in the present monograph. The 157 smaller genera are not included. In addition to being the most speciose ant genera both in the New World and worldwide, *Pheidole* and *Camponotus* are also large enough to be called hyperdiverse with reference to all the other living genera of plants and animals.

underlying biological causes, making them more accessible to analysis and interpretation. Such is the approach I have taken in the study of *Pheidole*.

In a separate body of evidence favoring the idiosyncratic biological nature of hollow curve distributions, Stanley et al. (1981) and Flessa and Thomas (1985) found that fossil lineages of marine invertebrates tend to proliferate in nonrandom and often synchronous patterns through time. Similarly, Cracraft (1984) has pointed out that sister clades of birds often differ in patterns of diversification, despite their broad sharing of plesiomorphic traits.

What general causes might be adduced to explain high levels of biodiversity? The best understood and documented causes can be summarized as follows: *dominance in biodiversity, including the extreme species richness ranked as hyperdiversity, is attained by a fortunate combination of small size, right demographic factors, preemption during colonization and subsequent incumbency, and a suite of key adaptations potent in opening new niches or excluding competitors*. Further, the most realistic models that can be constructed to describe the origin of the hollow curve distribution are those that assume a sequential origin of groups within a given geographic domain or their sequential invasion into the domain from outside, followed by a peaking and subsidence of biodiversity through evolutionary time.

Among the biasing factors of biodiversity, consider first size of the organism. One of the most solidly established rules of biodiversity, documented many times within most of the major groups of organisms, is that genera or higher taxa with small organisms have the largest number of species. Evolutionary biologists have generally agreed that the smaller the organisms, the more finely their species can divide the environment. Thus a dozen species of epiphytic flowering plants and a thousand kinds of insects can live and breed on a single tree, but at most only one to several arboreal lizard or frog species find the same tree adequate.

When species of a genus or family are divided into classes based on the size of the organisms, and the number of species in each class is plotted as a function of those classes, a unimodal distribution is usually produced. The curve is highest toward the lower size class, but not at the lowest of all. It is tempting to ascribe the drop-off toward the lower limit to the relative difficulty of sampling smaller organisms, but this cannot be the case for birds and mammals, which have been thoroughly sampled, and it is unlikely to be true generally. Dial and Marzluff (1988) have proposed the following alternative hypothesis to explain the result. First, species of small organisms within a group adapt better to variable environments because they reproduce faster and can survive better in restricted areas when environmental change reduces

the habitable area. On the other hand, species of large organisms do better in stable environments, an evolutionary trend that may be due to their superior ability to control resources. Alternation between variable and stable environments through evolutionary time, Dial and Marzluff argue, tends to cull species of both extreme sizes. In addition, a combination of high speciation rates and swifter colonization of fine-grained environments permits higher standing levels of diversity in the small to medium (but not in the smallest) size classes, pushing the mode toward the lower end of the curve.

High speciation rates, it should be kept in mind, cannot by themselves create or produce large amounts of standing diversity. A group can speciate explosively and over long periods of evolutionary time, but if its overall extinction rate is even greater, the standing diversity will not grow but instead decline toward zero.

In general, a successful clade should be expected to speciate logistically in a manner similar to that of a growing population. The first species with properties favorable to multiplication and radiation will most likely divide to produce one to a small number of species. These young species in turn, by adapting to new niches, then spread the ecological and geographical range of the clade as a whole. At first the multiplication into daughter species will be faster than the rate of species extinction, causing the clade to grow exponentially. But as evolutionary time passes, the still unoccupied niches and the available increment of geographical range must decrease, and the rate of speciation will fall to the rate of species extinction. As more time passes, millions of years in the case of the more persistent clades, and for various combinations of reasons both secular and episodic, the extinction rate surpasses the rate of species formation, and the standing diversity as a whole descends. The life span of clades, from the birth of a species as it cleaves from its sister species to its extinction or the extinction of the last of its descendant species, varies greatly among higher categories. For example, it is about 6 million years for starfish and other echinoderms, 1.9 million years for graptolites (colonial animals distantly related to the vertebrates), 1.2 to 2 million years for ammonites (shelled mollusks resembling modern cephalopods), and 0.5 to 5 million years for mammals.

What other properties promote high levels of diversity? In a far-ranging correlative analysis of land vertebrates and plants, Marzluff and Dial (1991a) found that the more diverse taxa constituting clades, whether the clades are classified as genera, families, or orders, tend to have short generation times, based on an early age at first reproduction and a brief average life span. The most diverse taxa also have superior dispersal ability and high resource availability.

From these generalizations, it may be less surprising to learn that one of every 30 species of organism known in the world is a member of the weevil superfamily Curculionoidea. Containing about 60,000 described species in 5,200 genera, these small insects are ancient, dating to the late Jurassic. They are strong fliers with short generation times, and were favored during their evolutionary history by the origin of the angiosperms, which became their principal hosts and gave them access to a vast food supply to colonize and preempt. One family of curculionoids, the Curculionidae, which are especially efficient at ovipositing deeply into plant tissues, comprises 50,000 of the described species all on its own (Farrell 1998; Oberprieler 1999).

As has generally been believed by evolutionary biologists since the time of Sewall Wright's original theory (1931), and as well is documented for example by Bush et al. (1977), species divided into demes, in other words small, partially isolated populations, evolve and speciate more rapidly than large, continuous populations. Such demes, for example, are often formed in social species fragmented into partially closed packs, troops, clans, or other behaviorally delimited groups. The conventional explanation of the effect, due to Sewall Wright, is that small population size increases inbreeding, which leads to significant amounts of genetic drift, defined as the shift of gene frequencies by chance alone. Genetic drift can also occur by the founder effect, the origin of chance differences in the genomes of small sets of individuals that emigrate to start new demes. An example of the founder effect has been described by Melnick (1988) in the rhesus macaques of Pakistan. In this highly social species, matrilines stay together in well-integrated troops over many generations. As a result, they constitute demes. During genetic and demographic monitoring over 40 months, Melnick and his co-workers discovered that strong differences existing between the rhesus troops are due not to inbreeding, but to a high rate of insemination of females in each troop by a proportionately small number of males.

It is important to keep in mind that swift deme divergence and high speciation rates do not automatically translate into high diversity, because any speciation rate can be balanced by an equal extinction rate. The balance can be reached while standing diversity is low or high. Aware of this disjunction between rate and equilibrium, Marzluff and Dial (1991b) conducted a correlative test of the relationship between degree of sociality and taxonomic diversity in birds, mammals, and insects, and found no consistent relationship.

It is useful to distinguish between two hypotheses concerning the effect of social evolution on taxonomic diversity. The first, the *plesiomorphic driver hypothesis,* suggested for example by Bush et al. (1977) and one I have also intuitively favored (Wilson 1975a), holds that the many demes of socially organized species possess a common (plesiomorphic) trait that drives up the level of taxonomic diversity. The second explanation is the *apomorphic*

adaptation hypothesis, favored by Marzluff and Dial on the basis of their correlative evidence. It holds that sociality is not a general plesiomorphic adaptation forcing diversification but rather an apomorphic (derived) trait that adapts organisms to certain environmental challenges; species-level diversity is then determined primarily by the environmental challenges. In fact, since both plesiomorphic and apomorphic traits are likely to be adaptive, the difference between the two explanations may not be as great as first appears.

What then, if not the proneness to deme formation, constitutes the forces that press clades toward high levels of biodiversity? Preemption and incumbency must be well up on the list. There are two ways by which species achieve them. The first is superior long-distance dispersal power, allowing early invasion of newly opened environments such as emerging oceanic archipelagos, freshly formed great lakes, and grasslands and other biomes born during climatic change. The second mode is a breakthrough adaptation that either allows the creation of a major new niche within an already established ecosystem or else confers an edge over rivals and predators in niches already filled. These two serendipities grade one into the other, on the one hand because to develop superior powers of long-distance dispersal is itself a breakthrough adaptation, and on the other hand because a breakthrough adaptation is also likely to serve well in recently created environments. The principal difference between newly assembled and mature ecosystems is that in newly assembled ecosystems the niches are more open and the enemies it contains less formidable.

The advantages to species that colonize a newly evolving ecosystem, or a major niche in an old one, are much the same as those described for new industries by Alfred Chandler in his 1977 classic *The Visible Hand: The Managerial Revolution in American Business.* Like Standard Oil and Ford Motor Company, the 350–400 colonizing species that gave rise to the estimated 10,000 contemporary endemic insect species of Hawaii (Howarth and Mull 1992; Otte 1994) enjoyed considerable unclaimed natural resources and room for evolutionary expansion. For a while they could experiment and still thrive with adaptive half-measures. While their competitors were increasing by subsequent invasions, they still had time to evolve to higher levels of efficiency and competitiveness. As a consequence, many such biotic clades, like pioneer corporations, have enjoyed exceptionally long life.

There is another reason why success begets success. The ability to disperse and diversify is not an accident. Large adaptive radiations are more likely than small adaptive radiations to generate *r*-strategy species biologically specialized for dispersal or species that prefer river banks, littoral zones, and other staging areas where long-distance dispersal is more likely to occur. In addition, a clade prone to produce many kinds of specialized species is more likely to generate at least one specialist that hits upon a breakthrough innovation.

Finally, species-level selection favors the diverse clade. An ensemble of cognate species that is geographically widespread and differentiated into both generalist and specialized species is more likely than its more restricted sister clade to survive environmental change. Even if a large number of its species and demes perish, a few will pull through somewhere, perhaps to renew major diversification.

All of the hypotheses, correlative analyses, and speculations I have reviewed so far have been very broad, even abstract in nature. Constructed by many investigators in steps, they represent the beginnings of a general theory of the origin of biological diversification at the species level. I believe that evolutionary biologists are now at the cusp of a new, much more detailed empirical shift in their investigations. The next step will be to address more explicitly a simple question: *What are the adaptations that promote ecological dominance within a clade?* Two formidable obstacles stand in the way of any easy answer to this question. The first is the extreme particularity of the phenomena to be investigated. Even if we identified the leveraging adaptations we seek clade by clade, the final result might prove to be pure natural history, each account unconnected to the rest in details of biology and environmental circumstance. And then, even if general patterns in the natural history could be spelled out, how could it be proved that the adaptations cited were truly the decisive ones? Clades typically have multiple plesiomorphic traits. It may prove very difficult to choose convincingly among them.

No evolutionary biologist has an easy solution to these problems. But a hard-won answer conceivably exists, and might be obtained by repeated use of the following procedure. *Once the phylogeny of a group of clades has been inferred, choose those that have radiated extensively and repeatedly in different geographic theaters of opportunity. Then find the plesiomorphic traits that are both diagnostic for the most successful clades and rarely if ever reversed within them.*

One of many taxa amenable to this approach is the Trigoniidae, which expanded dramatically in the Triassic to become the dominant family of shallow-burrowing bivalve mollusks of near-shore marine habitats and persisted until their near extinction at the end of the Cretaceous (Stanley 1977). Today only *Neotrigonia* of Australia and New Zealand survives. Chiefly inhabitants of coarse, shifting substrate, the trigoniids were essentially the cockles of the Mesozoic. They possessed a powerful foot that was highly efficient for burrowing and, judging from *Neotrigonia,* probably even conferred the ability to jump. Other, coadapted features contributed to the success of the group. They included enormous, complex hinge teeth that kept the valves aligned at

the wide angles required by the oversized foot, and in many species, unusual arrays of knobs or ridges on the shell surface that gripped the substratum during burrowing.

Contemporary leaf beetles (superfamily Chrysomeloidea) and weevils (superfamily Curculionoidea), which compose the single clade Phytophaga, contain about 80 percent of all living herbivorous beetle species, and perhaps half of all herbivorous insect species. The hyperdiversity and ecological dominance of beetles generally was due first to a shift, in the Mesozoic, from feeding mostly on decaying organic material (saprophagy) to feeding mostly on plants (herbivory). The next shift occurred in the Chrysomeloidea and Curculionoidea, during the late Cretaceous and early Tertiary, from specialization on conifers and cycads to concentration on the newly dominant angiosperms (Anderson 1995, 1999; Farrell 1998). The unmistakable key adaptation of the weevils is endophytophagy, the deep penetration of plant tissues to feed on them directly. The most diverse weevil family of all, the Curculionidae, was reached by a series of stepping-stone adaptations, described vividly by Oberprieler (1999):

> From their cucujoid ancestor the weevils inherited the successful coleopteran body form with protective elytra, as well as an incipient phytophagy, probably pollen feeding. Enclosure of the pollen-sacs of their apparent original hosts, Jurassic conifers, into strobili seemingly prompted the elongation of the weevil face into a rostrum, initially for adult feeding as preserved by extant Nemonychidae. In the belid lineage, the elongated rostrum took on the function of a sclerotized ovipositor, representing the first key weevil adaptation and enabling a truly endophytophagous way of life of the larva in nearly all plant tissues. The rise of the angiosperms in the Cretaceous provided the next adaptive zone for weevils, traced by the origin of the Brentidae and a drastic rise in weevil diversity. However, the brentid rostrum remained an ineffective tool for penetrating deep-lying plant tissues, being obstructed by the antennal insertions. Extreme developments of this type of rostrum carry serious disadvantages that can only be sustained in exceptional cases, as exemplified by female *Antliarhinus zamiae*. The development of a more efficient rostrum, in which the elongated basal antennal segments fold back into grooves on the rostrum, characterises the most diverse weevil family, the Curculionidae. It allows deeper penetration of plant tissues with a shorter and stronger rostrum and is evidently the most crucial of all weevil adaptations, opening up the full structural and taxonomic diversity of not only angiosperms but also earlier plant groups to the weevils and resulting in the staggering number of more than 50,000 described and nearly 300,000 estimated species in this family.

Many other such key advances presented by systematists in their respective groups of expertise have been ably summarized and categorized by Heard and Hauser (1995).

Now I will risk a hypothesis that explains the ecological dominance and taxonomic hyperdiversity of *Pheidole*. The one trait that distinguished all known species of *Pheidole* is their unusual large-headed major subcaste. Except for a handful of social parasites scattered through four of the species groups in different parts of the world, there is no evidence of the evolutionary loss of this subcaste in any clade. Even in these instances the parasites live with host colonies that themselves possess majors. And in the one parasitic species (*inquilina*) known to possess a rudimentary worker caste, the major subcaste is still present. The major subcaste is associated in all known *Pheidole* species with another trait that appears coadapted with it. This is the reduction of the sting in both the major and minor to a vestigial condition without, in at least the vast majority of species, a compensatory increase of defensive exocrine secretions, an enhancement that characterizes, for example, the large subfamilies Dolichoderinae and Formicinae.

This suite of changes has allowed *Pheidole* to achieve an extreme division of labor in which an unusually heavy reliance for defense is placed on the major caste. The majors, as the surrogate for the sting and most of the toxic chemical armament of the colonies, are a highly mobile strike force. They have also differentiated dramatically from one clade to the next within *Pheidole* as part of the exceptional adaptive radiation achieved by the genus. In most species, the minors summon them from the nest to attack enemies or help subdue and transport large prey. In a minority of species, for example those composing the *distorta* and *lamia* groups as well as many members of the *tristis* group, the majors are anatomically and behaviorally specialized to serve as house guards, remaining in the nest to fight or block the way of intruders. Many, as in the *pilifera* group and probably most of the *flavens* and *tristis* groups as well, further serve to mill seeds collected by the minors. Some may also function as semi-repletes for the long-term storage of liquid food, although the evidence for this role is scant. Finally, as evidenced by *bicarinata* in the *pilifera* group and *dentata* in the *fallax* group, in which the phenomenon has been experimentally studied, the majors function as an emergency standby caste. They are able to take over the labor roles of the minors, albeit clumsily, when the ranks of the smaller caste have been depleted.

Another specialized trait of *Pheidole,* although not yet well enough studied to be called universal, is the absence of ovaries in both the minors and majors. Combined with the lightness of their chemical armament and sting apparatus, the minors in particular have the appearance of a "throwaway"

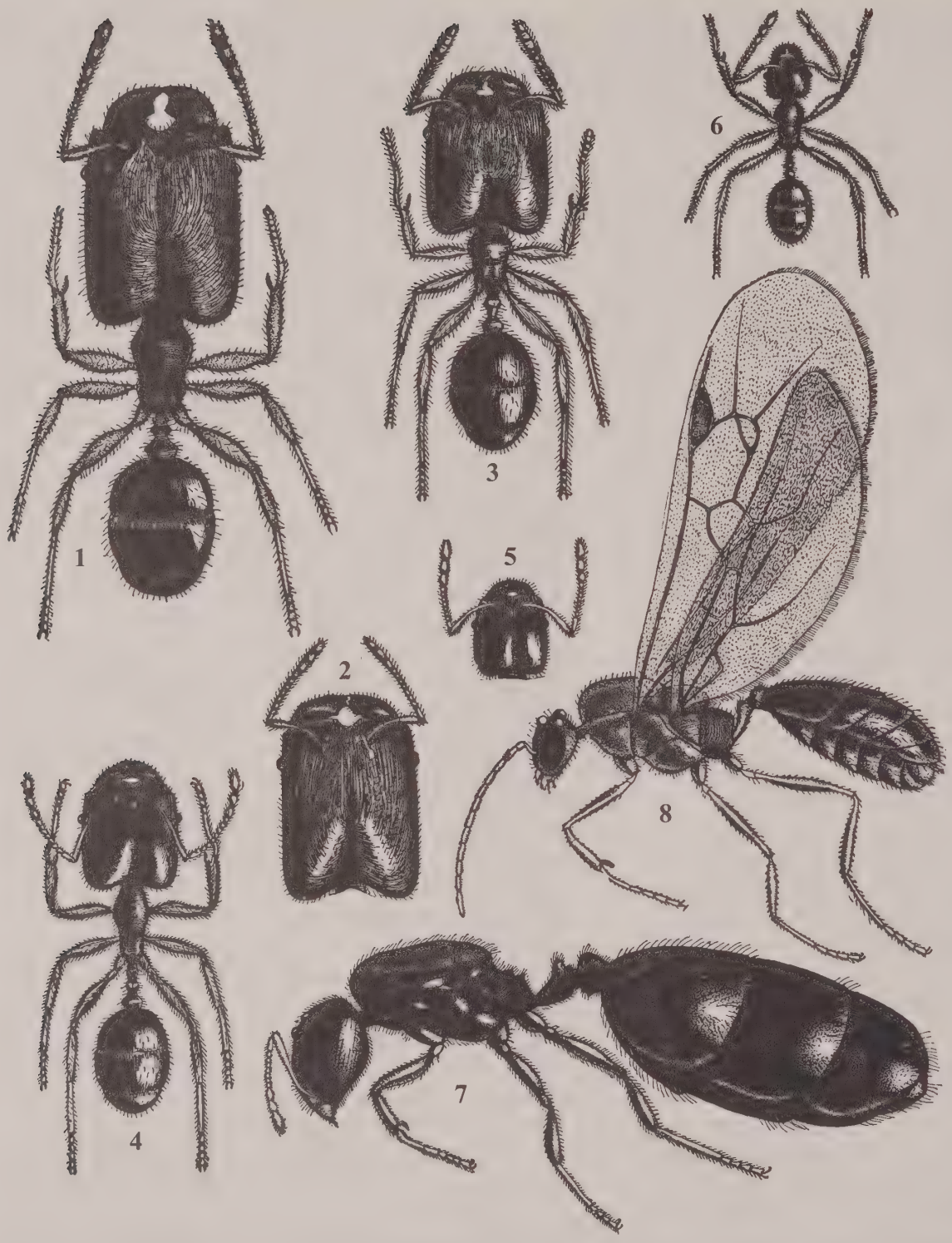


Figure 9 William Morton Wheeler's 1910 illustration of *Pheidole tepicana (= P. instabilis),* which is reproduced here, is the classic depiction of castes in ants. *P. tepicana* is one of several members of the genus that possess continuous polymorphism in the worker caste, culminating at the upper size range in a supermajor: supermajor *(1, 2)*; major-supermajor intermediate *(3)*; "typical" major *(4)*; major-minor intermediate *(5)*; minor *(6)*; queen *(7)*; male *(8)*. (Modified from Wheeler 1910b: 89.)

caste, that is, small, light, cheaply manufactured, and short-lived. These traits join the relatively small size of the ants and their short colony reproductive time to make possible the remarkable ecological success and hyperdiversity of *Pheidole*.

In sum, as I have come to interpret the genus, the typical *Pheidole* colony is an unusually resilient superorganism able to expend and replace minor workers readily while utilizing the major subcaste both for defense and as an emergency labor force in the event of severe depletion of the minors. The majors are especially efficient as a defense force, able to mobilize quickly and thus reduce the need for stings or elaborate, energetically expensive chemical systems. These traits join the relatively small size of the ants and their short colony reproductive time to make possible the remarkable ecological success and hyperdiversity of *Pheidole.*

Glossary and Anatomy

The terms defined here are those used in the present monograph. For wider and more detailed glossaries, consult Hölldobler and Wilson (1990) and Bolton (1994) on ants generally and Torre-Bueno (1989) for insects as a whole.

alitrunk A term often used for the **mesosoma** (q.v.), or middle tagma (major segment) of the body, between the head and waist. (See Figure 10.)

angulate Forming an angle, as for example the meeting of two faces or planes of a body part (**subangulate** means that the angle formed is rounded to some degree, yet not enough to create a lobe or semicircular surface).

antenna (pl. **antennae**) The two antennae of *Pheidole* and other insects are the primary sensory "feelers" of the head. In ants each antenna is elbowed, consisting first of the scape, the very long basal segment, which articulates with the head, and the funiculus (or flagellum), composed of the flexible chain of succeeding segments. In *Pheidole* the terminal 3 (rarely, 4) segments of the funiculus are swollen to form the antennal club. (See Figure 10.)

antennal club The swollen terminal segments of the antenna, in *Pheidole* usually numbering 3, rarely 4 or (in two species respectively from Borneo and Java), 5.

antennal fossa The shallow circular pit that surrounds the antennal insertion.

antennal scrobe A long depressed area on each side of the head that receives the scape or even the entire folded antenna.

appressed See **recumbent**.

basal In general, "next to"; e.g., the basal part of the antennal scape is that next to the insertion of the scape on the head; contrast to **distal** (q.v.).

basal face of the propodeum The anterior upper surface of the **propodeum**, which in *Pheidole* meets the posterior or declivitous (descending) face to form a strong curve or angle.

carina (pl. **carinae**) A relatively prominent, nonwavy keel-shaped ridge on the body surface, e.g., one or two carinae run the length of the midsection of the **clypeus** in some *Pheidole* species; contrast with **ruga** (q.v.).

carinula (pl. **carinulae**) A small carina, i.e., small nonwavy keel-like ridge, on the body surface. Easily confused with striae, or "scratches" on the surface, carinulae are the prevailing form of linear (line-like) sculpturing on the body surface of *Pheidole*; contrast with **rugula** and **rugoreticulum**. (See Figure 9.)

carinulate Covered wholly or partly by **carinulae**.

clavate Club-shaped, thickening gradually toward the tip, referring to the unusual form taken by some hairs of a few *Pheidole* species.

clypeal Pertaining to the **clypeus**.

clypeus The anteriormost section of the dorsal surface of the head, just forward of the antennal insertions and frontal triangle, consisting of a midsection and two lateral wing-like sections. (See Figure 10.).

concolorous Having the same color or shade of color over all the body or over a stated part of the body.

conulate Shaped like a small cone, as are the lateral extensions of the petiole in some *Pheidole* species.

cornicle A small cone or hornlike structure.

corniculate Shaped like a small horn, such as the vertical processes on the clypeus of some *Pheidole* species, or bearing small hornlike structures.

declivitous Descending, as the declivitous (posterior) face of the propodeum.

denticle A small tooth.

distad "Farther from"; thus, the funiculus of the antenna is distad to the scape with reference to the antennal insertion.

distal In general, "farthest from"; e.g., the distal part of the antennal scape is that farthest from the insertion of the scape to the head; contrast with **basal**.

dorsal Pertaining to the dorsum, or upper surface.

dorsal-oblique view A view of any portion of the body, and especially in this monograph of the mesosoma, seen from above while tilted about 45 degrees to the side. (See Figures 9–10.)

dorsum (pl. **dorsa**) Upper surface.

EL Eye Length, the maximum length of the eye, a standard measurement.

erect Referring to a hair that stands perpendicular to the surface from which it arises, or nearly so. (See also **suberect** and Figure 9.)

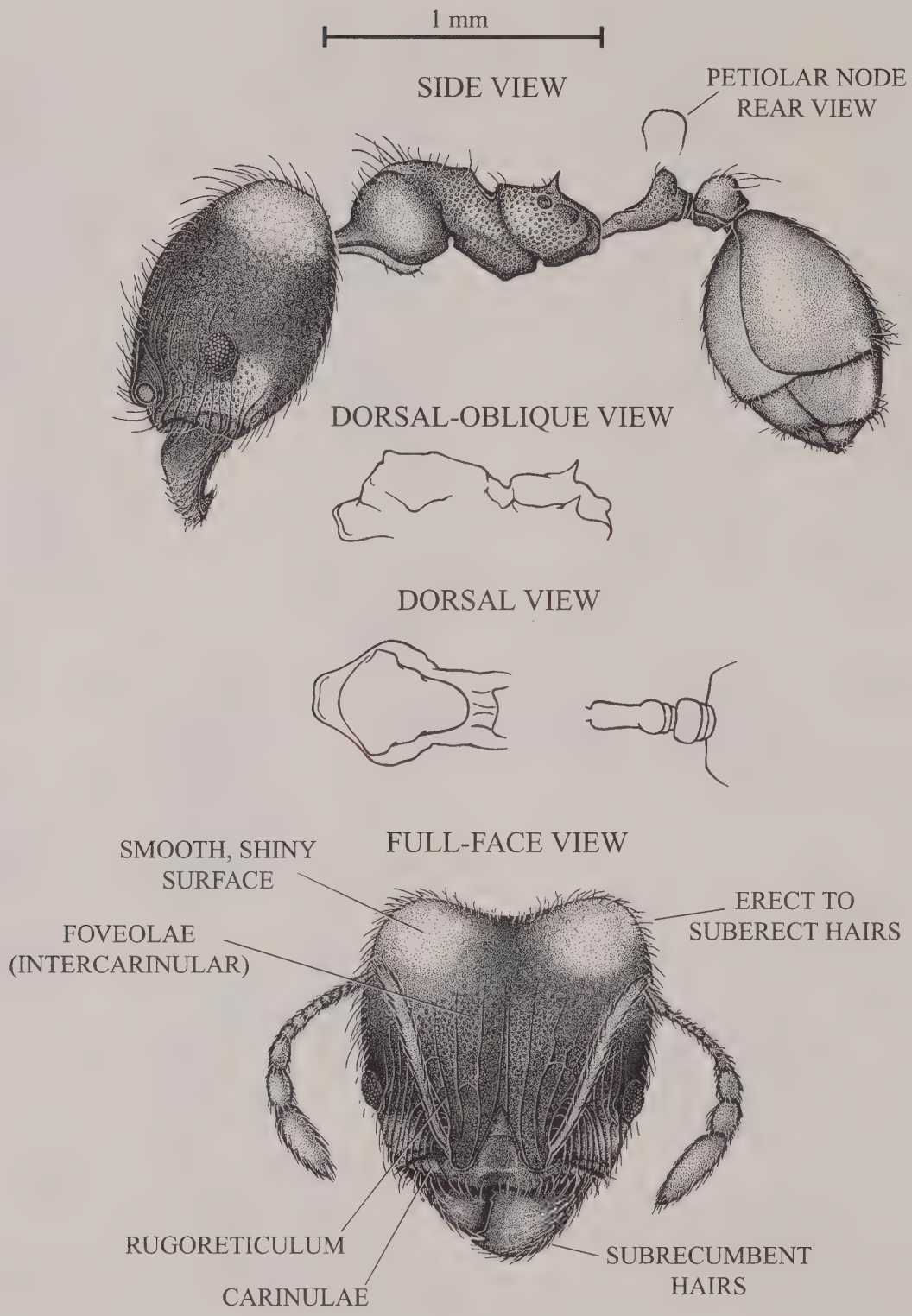


Figure 9 Anatomical views.

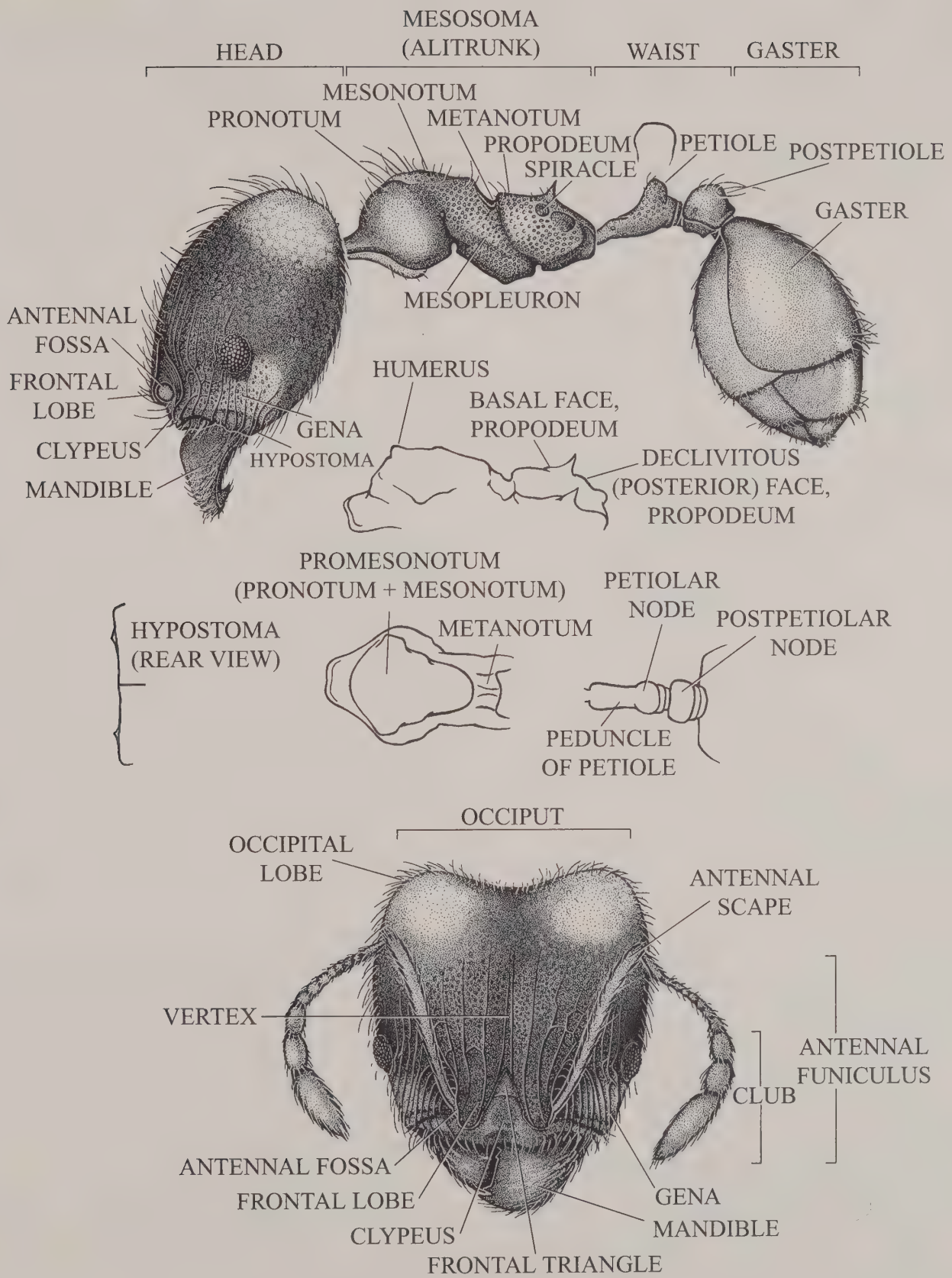


Figure 10 Anatomy defined.

eye length See **EL**.

fossa (pl. **fossae**) A circular depression, such as the antennal fossa, the shallow pit surrounding each antennal insertion in *Pheidole*.

foveola (pl. **foveolae**) A small rounded pit on the surface of the exoskeleton; many dense aggregates of foveolae render the surface opaque, in other words rough enough to reflect little or no light.

foveolate Covered wholly or in part with foveolae, or small pits.

frontal carina A prominent keel-shaped ridge that runs posteriorly from the outer edge of each antennal lobe across part of the dorsal surface of the head. Anteriorly, it expands as the **frontal lobe** in many *Pheidole*.

frontal lobe The anterior expansion of the frontal carina into a flange or shelflike structure. In full-face view it often covers the antennal insertion, and it sometimes projects vertically from the surface of the head. (See Figure 10.)

full-face view The dorsal surface of the head capsule seen in full face, with the rear border (occiput) aligned on the same plane as the anterior border (anterior clypeal margin).

gaster The terminal major division of the body, posterior to the **waist**. (See Figure 10.)

gastral Pertaining to the gaster, or to some part of it such as the first gastral tergite.

gena The cheek, or lower lateral portion of the head, located between the eye and the clypeus. (See Figure 10.)

genal Pertaining to the **gena**.

head length See **HL**.

head width See **HW**.

HL Head Length, a standard measure, taken in full-face view from the transverse level of the posteriormost part of the occiput to the anteriormost transverse level of the anterior clypeal border.

humeral Pertaining to the humerus, or "shoulder" of the **mesosoma** (mid-portion of the body).

humerus (pl. **humeri**) "Shoulder" of the **mesosoma**, or more precisely the anterolateral portion of the **pronotum**; best seen in **dorsal-oblique view** (Figures 9–10).

HW Head Width, a standard measure, taken in full-face view across the widest part of the head viewed in full face, exclusive of the eyes.

hyperdiverse Referring to a taxonomic group, such as the genus *Pheidole,* containing an extremely large number of species. (See also **speciose**.)

hypostoma Ventral anterior rim of the head capsule, just beneath the mandibular insertions and buccal cavity (see Figure 10). The number and shape of teeth on the hypostoma are important taxonomic characters in *Pheidole*.

hypostomal Pertaining to the **hypostoma** (q.v.) e.g., hypostomal teeth.

interspace Any space between two objects; an example is the interspaces between patches of sculpturing on the body surface.

laterad Close to a stated object in the direction of the margin, referring especially to structures on the head. The eyes, for example, are laterad in full-face view to the frontal lobes. Contrast with **mesad**.

lobose Shaped like a lobe, as for instance a rounded frontal lobe, or surmounted by a lobe, for instance as a lobose projection from the humerus.

major worker (often called **major** for short) The larger "soldier" caste, which in *Pheidole* also has a disproportionately larger head; contrast with **minor worker** and **supermajor worker**.

mesad Close to a given object and in the direction of the midline, referring especially to structures on the head. The frontal lobes, for example, are mesad to the eyes. Contrast with **laterad**.

mesonotal Pertaining to the top portion of the **mesonotum**. (See Figure 10.)

mesonotum The central portion of the top of the thorax. (See Figure 10.)

mesopleuron The lateral portion of the **mesothorax**. (See Figure 10.)

mesosoma Also called the **alitrunk** (see Figure 10). The middle tagma or major portion of the body, between the head and waist. The mesosoma comprises the true thorax, the primitive middle part of the body in insects, plus the **propodeum**, the primitive first segment of the abdomen. During hymenopteran evolution, in the origin of the suborder Apocrita, the propodeum was constricted posteriorly from the remainder of the abdomen and broadly attached anteriorly to the thorax.

mesosomal Pertaining to the **mesosoma**.

mesothoracic Pertaining to the **mesothorax**.

mesothorax The middle segment of the thorax, the parts of which described in this monograph include the **mesonotum**, or top portion (uppermost sclerite), and **mesopleuron**, or side portion. (See Figure 10.)

metallescent As used in descriptions of ants, referring to the metallic bluish or other metal-like reflections from the body obtained in certain angles of light reflection.

metanotal Referring to the **metanotum**, or top portion of the posterior segment of the thorax, e.g., the metanotal groove. (See Figure 10.)

metanotum The top portion of the posteriormost of the three segments of the thorax, which in species of the hymenopteran suborder Apocrita, including the ants, is located between the **mesothorax** and the **propodeum**, and in *Pheidole* in particular is reduced to a narrow strip (see Figure 10). When the metanotum is sunk to some extent between the mesonotum and basal face of the propodeum, the depressed strip is often called the metanotal groove.

metapleuron The lateral portion (sclerite) of the metathorax, just beneath the metanotum. (See Figure 10.)

midline The line in the center that divides the left side from the right side, as the midline of the head.

minor worker (often called **minor** for short) The smaller, "ordinary" worker caste; contrast with **major worker** and **supermajor worker**.

myrmecophyte One of a large number of plant species with specialized structures, such as inflated stems and leaf bases, that attract and harbor ants.

nuchal collar A thin, relatively narrow expansion of the rear of the head, terminating the occiput and surrounding the articulation of the head to the prothorax. Occurs in the minor worker of a small minority of *Pheidole* species.

occiput The extreme rear portion of the head. (See Figure 10.)

ocellus (pl. **ocelli**) One of the small, single-faceted eyes in the center of the **dorsum** of the head; the major workers of several *Pheidole* species possess a single median ocellus, but the majors and minors of the vast majority lack ocelli altogether.

opaque Referring to some part of the body surface that is foveolate, shagreened, or otherwise sculptured so as to be dull rather than shiny.

peduncle A stem-like connecting part, such as the peduncle of the petiole. (See Figure 10.)

petiolar node The raised, knot-like upper portion of the petiole. (See Figure 10.)

phenetic (adv. **phenetically**) Pertaining to the character traits of a species and their similarity to or difference from the character traits of other species, not necessarily with reference to the phylogenetic relationships they may or may not reflect.

phragmotic Referring to a body part that is truncated and usually also armored with roughly sculptured, thick cuticle. Majors of the *Pheidole lamia* group have a phragmotic anterior part of the head. The major of *P. setsukoae* has a phragmotic occiput, while the queen of *embolopyx* has a phragmotic rear of the **gaster**. Phragmotic body parts are thought to be used to plug the nest entrance and galleries against invaders, but this function has been proved thus far only in *P. lamia*.

phylogeny The branching tree of relationships among taxa, including species.

piligerous Bearing hairs (setae); the term is used especially for a piligerous fovea—from which a single hair emerges.

pilose Hairy, or bearing hairs (**setae**), usually many hairs.

pilosity Referring to the hairs (**setae**) of any part or all of the body.

polygynous Referring to an insect colony that has two or more inseminated queens, which either lay eggs or are capable of doing so.

postpetiolar node The raised, knot-like upper portion of the **postpetiole**. (See Figure 10.)

postpetiole The second segment of the 2-segmented **waist**. (See Figure 10.)

promesonotum The combined **pronotum** and **mesonotum**, composing the bulk of the upper portion of the **mesosoma** (midsection of the body). (See Figure 10.)

pronotal width See **PW**.

pronotum The upper portion of the **prothorax**. (See Figure 10.)

propodeal Pertaining to the **propodeum**.

propodeum The rear segment of the **mesosoma** (see Figure 10). The propodeum in *Pheidole* and other hymenopterans of the subfamily Apocrita is homologous to the first segment of the abdomen; it was constricted posteriorly during evolution and fused with the thorax to form a single compound unit, the **mesosoma**.

prothorax The first segment of the thorax, hence, also the first segment of the mesosoma (see Figure 10). In *Pheidole* the **pronotum**, or upper part, makes up almost all of the prothorax when viewed from either above or laterally.

punctate Bearing fine punctures in the exoskeletal surface, as though pricked with a needle; contrast with **foveolate** and **shagreened**.

PW Pronotal Width, a standard measure, the maximum width of the pronotum in exact transect seen from above.

recumbent. Referring to a hair that is aligned with the body surface to which it is attached, or even lying upon it. (See also **subrecumbent**, and Figure 9.)

ruga (pl. **rugae**) A prominent wrinkle, or wavy keel-like ridge, on the body surface; contrast with **carina**, a prominent straight keel-like ridge.

rugoreticulate Bearing a network of interconnected rugae or rugulae. (See Figure 9.)

rugoreticulum A network of interconnected rugae or rugulae. (See Figure 9.)

rugose Bearing **rugae** (q.v.).

rugula (pl. **rugulae**) A small ruga, or wavy keel-like ridge on the body surface; contrast with **carinula**, a small straight keel-like ridge.

scape The first or basal segment of the antenna, which in ants is extremely long compared to the length of the succeeding segments making up the funiculus. (See Figure 10.)

scape length See **SL**.

scrobe In some kinds of ants, including many species of *Pheidole,* a term referring specifically to the antennal scrobe, a long depressed area on each side of the head that receives either the folded scape or the entire antenna adjacent to it.

sculpturing Any irregularity, such as carinulae, foveolae, or shagreening, on the otherwise smooth and shiny body surface.

seta (pl. **setae**) A socketed hair; the term is often used as in this monograph interchangeably with hair generally.

shagreened Finely roughened, as in unpolished leather or sharkskin, creating an opaque (dull) surface.

SL Scape Length, a standard measure, taken from the base of the shaft (not including the condylar bulb and connecting neck) to the distal tip.

speciose A higher taxonomic group, such as a genus, that contains a relatively large number of species. See also **hyperdiverse**.

spiniform Spine-shaped.

spinose Bearing one or more spines.

sternite The lower sclerite of a segment, e.g., the first gastral sternite.

striate Scored with fine "scratches" or impressed lines on the surface; contrast with **carinulate**.

subangulate Referring to the junction of two sides of a body part, such as the front and rear sides of the lateral margin of the **postpetiole**, that meet in a blunt or rounded angle instead of either a smooth curve or a sharply defined angle.

subappressed See **subrecumbent**.

suberect Referring to a hair that stands nearly erect, forming an angle of more than 45 degrees or more with the body surface from which it arises. (See also **erect** and Figure 9.)

subpostpetiolar process A protrusion of some kind, such as a spine or lobe, on the ventral surface of the **postpetiole**.

subrecumbent Referring to a hair that either is almost parallel to the body surface from which it originates, or at most forms a 45-degree angle with it. If the hair is completely parallel with the surface or even lying on it, the hair is refered to as **recumbent** or **appressed**. (See Figure 9.)

subtriangular Roughly triangular in shape but with rounded or blunt apices.

supermajor worker (usually called **supermajor** for short) A very large major caste that coexists (in a small number of species) in the same colony with the smaller ordinary major caste; contrast with **major worker** and **minor worker**.

trimorphic Referring to a colony or species with three worker castes: major, supermajor, and minor. Only about 1 percent of New World *Pheidole* species are trimorphic, thus with supermajors, and almost all of them are limited to the southwestern United States and Mexico. The rest are dimorphic, with only majors and minors.

tropicopolitan Found in tropical areas around the world. *Pheidole megacephala,* a species of African origin dispersed accidentally by human commerce, is the only species of *Pheidole* with a nearly tropicopolitan range.

venter The lower surface of a segment or other major body part.

ventral Pertaining to the lower surface of a segment or major body part.

vertex The central dorsal surface of the head bordered between the frontal triangle and the **occiput**. (See Figure 10.)

waist In ants, the segment, usually constricted anteriorly and posteriorly, that connects the middle portion of the body (**mesosoma**) to the hindmost portion (**gaster**). Individuals of *Pheidole,* being typical members of the subfamily Myrmicinae, have a 2-segmented waist, composed of the anterior **petiole** followed by the **postpetiole** (see Figure 10).

Keys

Pheidole Species Placed in One Group and Also Keyed in Another Group (to Ensure Identification)

	Species	Placed in this group	But also keyed in this group
1.	*biolleyi*	*diligens*	*biconstricta*
2.	*cockerelli*	*fallax*	*crassicornis*
3.	*texana*	*fallax*	*crassicornis*
4.	*plato*	*biconstricta*	*diligens*
5.	*dione*	*fallax*	*diligens*
6.	*nitidula*	*fallax*	*diligens*
7.	*pampana*	*fallax*	*diligens*
8.	*gaigei*	*tristis*	*diligens*
9.	*fissiceps*	*biconstricta*	*fallax*
10.	*fariasana*	*crassicornis*	*fallax*
11.	*laevinoda*	*diligens*	*fallax*
12.	*oxyops* (in part)	*diligens*	*fallax*
13.	*prostrata*	*diligens*	*fallax*
14.	*texticeps*	*diligens*	*fallax*
15.	*azteca*	*pilifera*	*fallax*
16.	*hirtula* (in part)	*pilifera*	*fallax*
17.	*obtusospinosa* (in part)	*pilifera*	*fallax*
18.	*deceptrix*	*tristis*	*fallax*
19.	*steinheili*	*tristis*	*fallax*
20.	*roushae*	*fallax*	*flavens*
21.	*defecta*	*pilifera*	*flavens*
22.	*cataphracta*	*punctatissima*	*flavens*
23.	*cramptoni*	*tristis*	*flavens*
24.	*eparmata*	*tristis*	*flavens*
25.	*nigella*	*tristis*	*flavens*
26.	*polita*	*tristis*	*flavens*
27.	*sciophila*	*fallax*	*pilifera*
28.	*nasutoides*	*flavens*	*pilifera*
29.	*oaxacana*	*flavens*	*pilifera*
30.	*scabriventris*	*flavens*	*pilifera*
31.	*cataractae*	*diligens*	*punctatissima*
32.	*cielana*	*fallax*	*punctatissima*
33.	*nubicola*	*fallax*	*punctatissima*
34.	*citrina*	*flavens*	*punctatissima*
35.	*daphne*	*flavens*	*punctatissima*
36.	*onyx*	*flavens*	*punctatissima*
37.	*riveti*	*diligens*	*tristis*
38.	*astur*	*fallax*	*tristis*
39.	*claviscapa*	*fallax*	*tristis*
40.	*tigris*	*fallax*	*tristis*
41.	*mittermeieri*	*flavens*	*tristis*
42.	*tetrica*	*flavens*	*tristis*

Key to the Workerless Social Parasites of the New World *Pheidole,* Based on the Queen

1 Queen antenna 10-segmented, with a 1-segmented club (parasite of *P. nitidula* of Argentina; placed provisionally in *fallax* group) ..... ***argentina***

Antenna 9- to 12-segmented, with a 3-segmented club **2**

2 Mandibles of queen reduced to tiny appendages, which are toothless, tapered to a blunt point at the end and only 0.06–0.07 mm long; male brachypterous and pupiform (parasite of *P. nitidula* of Argentina; placed provisionally in *fallax* group) ..... ***acutidens***

Mandibles of queen normal in aspect **3**

3 Sides of postpetiole expanded into hornlike extensions that make the postpetiole as a whole 3× broader than the petiole when viewed from above (parasite of *P. ceres* in Colorado; placed in *pilifera* group) ..... ***elecebra***

Postpetiole normal in aspect, only 2× broader than petiole or less **4**

4 Occipital corners of queen's head angulate (parasite of *P. pilifera* in Colorado, Nebraska, and Nevada; placed provisionally in *pilifera* group); small numbers of parasite minors and majors sometimes appear among host workers ..... ***inquilina***

Occipital corners of queen's head smoothly rounded 5

5 Petiolar node in side view angulate at summit, its sides foveolate, crossed by longitudinal carinulae, and opaque (parasite of *P. obscurior* in Argentina; placed in *fallax* group) ..... ***kusnezovi***

Petiolar node in side view angulate at summit, its sides smooth and shining (likely parasite of *P. minutula* in Guyana, either temporary or permanent, but status uncertain; placed in *flavens* group) ..... ***microgyna***

Key to the Species Groups of the Nonparasitic New World *Pheidole,* Based on the Worker Castes

1	Antenna 10-or 11-segmented; very small Neotropical species (Head Width of major 0.5–0.7 mm)	2
	Antenna 12-segmented; size usually larger than 0.7 mm	3
2	Antenna 10-segmented	***perpusilla* group**
	Antenna 11-segmented	***tachigaliae* group**
3(1)	Antennal club 4-segmented; Head Width of major 1.2 mm or more (Nearctic and West Indian)	***granulata* group**
	Antennal club 3-segmented; Head Width of major variable	4
4	Head of major with deep scrobes within which the entire antennae can be folded; in addition, the frontal lobes are often expanded laterally so as to cover and hide the folded antennae	5
	Head of major either lacks antennal scrobes or else scrobes are present but too shallow to receive the entire folded antennae; also, the frontal lobes are never expanded enough to cover the folded antennae	6
5	Occiput in full-face view with one or more transverse carinae across its dorsum, which often demarcate the dorsum as a section distinct from the rest of the dorsal head surface (mostly Argentina, ranging to southern Brazil and Ecuador, but one species reaching Trinidad) (also, scan *scrobifera* group)	***aberrans* group**
	Occiput in full-face view lacking transverse carinae across its dorsum, which is usually rugoreticulate and occasionally longitudinally carinulate or smooth (widespread, Central and tropical South America)	***scrobifera* group**
6(4)	Entire central half of dorsal profile of major head "scooped out" (deeply concave to create a large semicircle in lateral profile) yielding in side view a twisted overall head shape (South America)	***distorta* group**
	Dorsal center of head of major in side view with at most a weak concavity, insufficient to alter the essentially oval shape of the head in side view, or else the concavity covers less than half the dorsal profile of the head and is located on the posterior half of the head just anterior to the occiput	7
7	Most or all of the dorsal surface of the posterior half of the head capsule of the major covered by a longitudinal row of prominent transverse carinae that form a ladder-like pattern. Head Width of major only 0.6–0.9 mm (Neotropical; also, scan *tachigaliae* group, which species are outwardly similar but have 11-segmented antennae)	***transversostriata* group**
	Dorsal surface of the head of the major lacks a ladder-like array of transverse carinae or else, rarely, such an array exists but then the major is much larger, with Head Width over 1.1 mm (see *arietans* of *tristis* group)	8

8 Head of major anteriorly phragmotic (anterior dorsal surface flattened and joining the posterior dorsal surface at a distinct, obtuse angle); dorsal surface of major head mostly or entirely foveolate or rugoreticulate, and opaque (southern United States to northern South America) ..... ***lamia* group**

Head of major not anteriorly phragmotic (*setsukoae* in the *pilifera* group is posteriorly, not anteriorly phragmotic), and its dorsal surface is variously rugoreticulate, carinulate, or smooth **9**

9 Metanotum of major, and not just its pronotum and mesonotum, long and convex in side view; as a consequence, the profile of the major's mesosoma in dorsal-oblique view (mesosoma rotated around long axis 45 degrees) has 4 convexities approximately equal in size (2 on the pronotum and one each on the mesonotum and metanotum) (represented in the New World by only one species, *teneriffana,* of Mediterranean origin, recorded from several widely scattered localities) ..... ***teneriffana* group**

Metanotum of major always very short, usually indistinct in side view, and rarely convex; as a consequence, profile of major's mesosoma in dorsal-oblique view has at most 3 convexities, whether equal in size or not **10**

10 Hypostomal border of major bearing only 2 or 3 teeth (one on each side of ventral midline of head, and 0 or one on the midline), or else no teeth at all. (A small number of species exiting here will also later exit from couplet 13 into couplet 14 and thus join the species exiting from the lower lug of couplet 10. This necessary maneuver has no effect on the flow of the key overall.) **11**

Hypostomal border of major bearing 4–5 teeth (one pair each laterad to the ventral midline of the head and 0 or one on the midline) **14**

11 Possessing *all* of the following traits. Large species (Head Width of major 1.4–1.9 mm). Major: mesonotum in side view forming a strong, usually symmetrical convexity; ventral margin of postpetiole in side view very weakly convex, straight, or weakly concave, and lacking a lobe or spine; head in full-face view heart-shaped; outline of head in full face bare of pilosity (exception: *simplex*). Minor: head narrowed posteriorly, with a nuchal collar (Central and South America) (if difficulty is encountered, also scan *diligens* and *fallax* groups) ..... ***biconstricta* group (in part)**

Possessing *one or more* of the following traits. Major: Head Width less than 1.4 mm or more than 2.0 mm; mesonotum with weak or asymmetrical convexity, or no convexity at all; ventral margin of postpetiole in side view moderately to strongly convex, or with a lobe or spine; head in full-face view roughly quadrate or rectangular; outline of head in full face fringed by hairs. Minor: occiput broad, lacking nuchal collar (U. S., Mexico; plus one widespread tropical tramp species, *megacephala,* in disturbed habitats) **12**

12 Possessing *all* of the following traits. Major and minor: in side view, entire postpetiole oval in shape, with all of the ventral margin bulging downward in a conspicuous convexity, the node low and weakly developed; mesonotal convexity absent, the promesonotal profile in side view forming a smooth, continuous convex line like the arc of a circle; color brownish yellow. Major: outline of head plus mandibles in full-face view forms a near-perfect heart shape; rugoreticulum present between eye and antennal fossa. Minor: occiput broad, lacking an occipital collar. (Occurs in disturbed habitats through much of tropical America, including southern Florida and Bermuda) ..... ***megacephala* group**

Possessing *one or more* of the following traits. Major and minor: postpetiole either roughly circular, semicircular, or irregular in profile, not oval, the node strongly developed, and the ventral margin as a whole not forming a conspicuous convexity; mesonotal convexity present; color yellow, brown, with or without reddish tinge, of various mixes and shades, but not brownish yellow. Major: outline of head together with mandibles in full-face view not heart-shaped, but roughly quadrate or rectangular; rugoreticulum absent between eye and antennal fossa. Minor: occiput narrow, with a nuchal collar **13**

13 Along with the bidentate or toothless hypostoma of the major, the major and minor have a roughly quadrate or short-rectangular head shape; i.e., in full-face view, the lateral margins of the head are straight to weakly curved, and the head capsule is as wide or almost as wide as it is long. Minor: eyes large compared to head size, the ratio of Eye Length to Head Length is 0.14 to 0.40, with the majority of species 0.20–0.25 (U. S. and Mexico, with only a few species known from south of the Mexican Plateau) ..... ***pilifera* group**

Either the major and minor have moderately to strongly curving sides of head; or the ratio of Eye Length to Head Length in the minor is 0.15 or less; or both of these traits are present (exception: *capillata,* placed in *gertrudae* group on overall habitus, q.v.) **14**

14(10,13) Possessing *all* of the following traits. Large species (Head Width of major 1.2–1.6 mm); scape of major conspicuously flattened near its base, its greatest width there equal or almost equal to or greater than its maximum width at transects along the distal (outer) half; petiolar peduncle and node of major thick; head of major strongly heart-shaped, with deep mid-occipital cleft and rounded sides in full-face view; minor with broad occiput in frontal view, lacking a nuchal collar (southern U. S. and Mexican Plateau) (if difficulty is encountered, also scan *diligens* and *fallax* groups) ..... ***crassicornis* group**

Possessing *one or more* of the following traits. Major either small to medium-sized (Head Width less than 1.2 mm) or very large (Head Width greater than 1.6 mm); scape much narrower at its basal segment than at its distal segment; petiolar peduncle and node of major slender; head of major roughly quadrate or rectangular, with a relatively shallow occipital cleft and straight to weakly convex sides in full-face view; minor with narrowed occiput and nuchal collar **15**

15 Possessing *all* of the following traits. Major and minor: propodeal spine absent or at least reduced to a short, wide angle or denticle; mesonotal convexity absent; propodeal spiracle conspicuously large, its greatest width equal to or greater than the distance between its dorsal border and the dorsal border of the propodeum in side view; medium to large (Head Width of major 1.1–1.6 mm) (Brazil, Peru) (if difficulty is encountered, also scan *diligens* group)..... ***gertrudae*** group

Possessing *one or more* of the following traits. Major and/or minor: propodeal spine well developed; mesonotal convexity present, with front and rear faces distinct in side view; propodeal spiracle small to medium in size, its greatest width less than the distance between its dorsal border and the dorsal border of the propodeum in side view; either small (Head Width of major less than 1.1 mm) or very large (Head Width of major greater than 1.6 mm)..... **16**

16 Possessing *all* of the following traits. Small species (Head Width of major 0.7–1.0 mm); slender body form; major with medium to long antennal scape, such that when the tip of the scape is touched to the lateral border of the head in full-face view, it reaches halfway between the eye and occipital corner, or farther; antennal scape of the minor moderately long, so that when laid across the occipital corner, the scape in full-face view exceeds the corner by at least 4× the maximum scape width; head of minor roughly quadrate or rectangular, sometimes narrowing at occiput, its posterior dorsal half completely foveolate and opaque, with no other sculpturing except, at most, short carinulae on the antennal fossa (Mexico, Central America, northern South America) (close to *flavens* group, which should also be scanned if difficulty is encountered) ..... ***punctatissima*** **group**

Possessing *one or more* of the following traits. Medium-sized to large species (Head Width of major over 1.0 mm); robust body form; majors with short antennal scape, its tip failing to reach as far as halfway between the eye and occipital corner; antennal scape of the minor short, so that when laid toward the occipital corner, the scape of the minor in full-face view exceeds the corner by less than 4× the maximum scape width; head of minor variously shaped, but neither quadrate nor rectangular; its posterior dorsal half smooth and shiny, carinulate, rugulose, or rugoreticulate; posterior half of head of dorsum of minor smooth and shiny, carinulate, or rugoreticulate, but not exclusively foveolate..... **17**

17 Possessing *all* of the following traits. Medium to very small (Head Width of major 1.2 mm or less, and in the great majority of species 1.0 mm or less); robust body form; mesonotal convexity in side view absent or at most vestigial, so that the profile of the promesonotum is continuous and descends to the metanotal groove either in a smooth curve or else abruptly through an obtuse angle (exception: *meinertopsis,* q.v., has a developed mesonotal convexity); antennal club thick compared with other segments of the funiculus; scape short, that of major extending at most slightly beyond the midpoint between the eye and occipital corner, and that of minor at most only slightly more than 2× its maximum width beyond the occipital corner (very abundant and diverse from U. S. to Argentina) (if difficulty is encountered, also scan *pilifera, punctatissima,* and *tristis* groups, and in the latter especially, the *flavens*-to-*tristis* intermediate "*carapuna* complex," comprising *boltoni, carapuna, cuprina,* and *tristicula*) ..... ***flavens*** **group**

Possessing *one or more* of the following traits. Medium to large (Head Width of major more than 1.2 mm); slender body form; mesonotal convexity in side view present, with defined anterior and posterior faces; antennal club only slightly thicker than remainder of funiculus; scape of major extending well beyond the midpoint between eye and occipital corner, and scape of minor by 4× or more its maximum width beyond the occipital corner..... **18**

18 Mesonotal convexity viewed from the side weakly developed or absent. Also, in most of the species the antennal scape of the major is very short, so that when the tip is touched to the lateral margin of the head in full-face view it reaches much less than half the distance from the eye to the occipital corner; in many of the species also, the frontal lobes or median clypeal carina of the major are extended prominently forward as angles, horns, or spikes (exclusively Neotropical, with most species South American and West Indian) (if difficulty is encountered, also scan *flavens* and *diligens* groups) ..... ***tristis* group**

Mesonotal convexity almost always strongly developed, rarely low and weak and never absent, always with clearly defined anterior and posterior faces: antennal scape of major usually reaches well beyond the midpoint between the eye and occipital lobe, seldom only to the midpoint; neither frontal lobes nor median clypeal carina of the major project forward in side view as angles, horns, or spikes (widespread in Nearctic and Neotropical regions) **19**

19 In full-face view, head of major almost always possesses parallel or nearly parallel and straight or weakly convex sides; major extensively sculptured, usually with some and often a great deal of rugoreticulum on head (and, in a few species, on the body also); both major and minor almost always densely pilose, with hairs abundant on occiput in full-face view (southern U. S. to Argentina) (in case of difficulty, the closely similar *biconstricta* and *diligens* groups should also be scanned) ..... ***fallax* group**

In full-face view, head of major with moderately convex sides, which with rest of head and mandibles form a roughly heart-shaped outline; most of body of major usually smooth and shiny; rugoreticulum present in a minority of species, and then only on the head, and further usually limited to the space between the eye and antennal fossa; most species sparsely to moderately pilose **20**

20 Possessing *all* of the following traits. Large species (Head Width of major 1.4–1.9 mm); in major, all of posterior half of dorsal head surface foveolate and opaque, and occipital border seen in full face devoid of pilosity; at least a small patch of rugoreticulum present in major between eye and antennal fossa; head of minor narrowed posteriorly, with nuchal collar (Neotropical) (in case of difficulty, the closely related *diligens* and *fallax* groups should also be scanned) ..... ***biconstricta* group (in part)**

Possessing *one or more* of the following traits. Head Width of major less than 1.4 mm or more than 1.9 mm; in major, posterior half of dorsal head surface smooth and shiny, or carinulate; no rugoreticulum present in major between eye and antennal fossa; occiput of minor broad, lacking nuchal collar (Neotropical, one still undescribed species in southern Arizona) (in case of difficulty, the closely related *biconstricta* and *fallax* groups should also be scanned) ..... ***diligens* group**

The *aberrans* Group

This compact and distinctive assemblage is probably monophyletic as constituted here. Most likely a sister group of the *tristis* group, it appears almost wholly limited to subtropical and warm temperate South America. One species, *fracticeps,* is known from Trinidad and Ecuador. Another species, *pullula* of Argentina, is transitional to the *tristis* group and placed there; it differs from all the *aberrans*-group species below in having a completely smooth occiput.

1 Major: short carinulae are present, but prominent transverse carinae do not extend all the way across the occiput in full-face view; in side view, a sharp toothlike projection points forward from the anterior third of the ventral profile of the petiole (Argentina) ..... ***subaberrans***

Major: one to several prominent transverse carinae extend all the way across the occiput in full-face view; in side view the anterior ventral profile of the petiole is either level or at most forms a low, rounded convexity **2**

2 Major: posterior half of the dorsal head surface smooth and shiny **3**

Major: posterior half of dorsal head surface covered by longitudinal carinae **4**

3 Mesopleuron of minor worker smooth and shiny; Head Length of major 1.4× its Head Width (Argentina, Uruguay, southern Brazil) ..... ***cavifrons***

Mesopleuron of minor worker covered by longitudinal carinulae; Head Length of major only 1.2× its Head Width (Argentina) ..... ***weiseri***

4(2) Major: frontal lobes in full-face view are hornlike, their tips forming sharp acute angles that project well beyond the anterior clypeal border (Argentina) ..... ***taurus***

Major: frontal lobes seen full face rounded or square, at most just reaching the anterior clypeal border **5**

5 Frontal lobes of major seen full face just reaching anterior clypeal border **6**

Frontal lobes of major seen full face ending behind anterior clypeal border **7**

6 Major: posterior half of side of head covered with parallel longitudinal carinulae; posterior fourth of dorsum of head covered by curved transverse carinulae; frontal lobes rounded anteriorly (Minas Gerais, Brazil) ..... ***minensis***

Major: posterior half of side of head bare; posterior one-fourth of dorsum of head bare except for dominant transverse carina; frontal lobes square in front (Argentina) ..... ***laticrista***

7(5) Major: frontal lobes seen in full face just reaching the posterior clypeal border laterad to the tips of the frontal lobes **8**

Major: frontal lobes seen in full face extending beyond the posterior clypeal border laterad to the tips of the frontal lobes **9**

8 Minor: pronotal dorsum bearing irregular carinulae; entire region between eye and antennal fossa covered with carinulae, foveolae, and rugoreticulum (Argentina) ..... ***lilloi***

Minor: pronotal dorsum lacking carinulae; region between eye and antennal socket foveolate only (Ecuador and Trinidad) ..... ***fracticeps***

9(7) Major: head bicolored, with portion anterior to eyes dark brown and rest of head yellow; head strikingly elongate (Head Length 1.6× the Head Width) (Misiones, Argentina) ..... ***longior***

Major: head concolorous light to reddish brown or yellow (Head Length only 1.1–1.2× Head Width) **10**

10 Major: pronotum longitudinally carinulate; Head Width 1.2 mm; body concolorous light brown (Argentina) ..... ***obnixa***

Major: pronotum bare; Head Width 1.4–1.7 mm; body reddish yellow or light reddish brown **11**

11 Major: in full-face view occipital carinulae dip anteriorly to a point to create a triangular field; in full face, external borders of frontal lobes concave; Head Width 1.7 mm (Argentina) ..... ***obscurifrons***

Major: in full-face view, carinulae not dipping anteriorly to a point to form a triangular field; in full face, external borders of frontal lobes straight; Head Width 1.4 mm (Argentina to central Brazil) ..... ***aberrans***

The *biconstricta* Group

These large, abundant, and aggressive ants form a relatively compact group with closest relationships to species of either the *diligens* or *fallax* groups. The species range variously from Mexico through Central America and tropical South America; they are unknown from the West Indies north of Trinidad. *P. biconstricta* itself is highly variable and may contain two or more sibling species. *P. plato* belongs to this group in all characters except for its possession of 4 hypostomal teeth instead of the 2 characteristic of the group.

1 Propodeum of major and minor completely lacking spines, the basal and declivitous surfaces of propodeum seen in profile joined by a smooth curve (Mexico to Nicaragua) ..... ***inermis***

Propodeum of major and minor bearing paired spines, which in one species (*socrates*) are reduced to denticles 2

2 Major: first gastral tergite smooth and shiny; in side view, the pilosity of dorsum of head that extends above the profile is appressed, and the hairs are oriented almost parallel to head surface (Costa Rica) (placed in *diligens* group; keyed out here also to ensure identification) ..... ***biolleyi***

Major: median half of first gastral tergite foveolate and opaque; hairs extending above the dorsal profile of head erect to suberect 3

3 Dorsal surface of pronotum mostly covered by parallel transverse carinulae; occiput covered by completely appressed, longitudinally oriented hairs; profile of vertex seen in side view flat (Brazilian Amazon) ..... ***fissiceps***

Dorsal surface of pronotum lacking carinulae; occiput lacking appressed hairs as described above; profile of vertex seen in side view convex 4

4 Major possesses 4 hypostomal teeth; major and minor pronotum in side view with a subangular convexity just in advance of the mesonotal hump, especially prominent in the minor (Ecuador) ..... ***plato***

Major possesses 2 hypostomal teeth (occasionally 4 in *biconstricta* and *fissiceps*); major and minor with no extra pronotal convexity, or if present it is evenly rounded 5

5 Large species (Head Width of major 1.8 mm, of minor 0.9 mm); propodeal spine of major only a denticle, shorter than width of the propodeal spiracle; major and minor light reddish yellow (Brazilian Amazon, Guianas) ..... ***socrates***

Small species (Head Width of major 1.4–1.6 mm, of minor 0.6–0.8 mm); propodeal spine as long as width of propodeal spiracle or longer; major and minor reddish yellow or light brown 6

6 Head densely pilose, in full-face view with a fringe of dozens of suberect hairs; head and mesosomal dorsa of minor seen from side with dense covering of hairs, many longer than length of the eye; body reddish yellow (Amazonian Brazil and Peru)..... ***simplex***

Head sparsely pilose, in full-face view exclusive of clypeus with only a scattering of at most several hairs; head and mesosomal dorsa of minor seen from side with sparse hairs, most not as long as length of eye; body light brown (widespread in South and Central America) ..... ***biconstricta***

The *crassicornis* Group

This compact assemblage of medium-sized species is an apparent monophyletic offshoot from a common ancestor with the *fallax* group, or else a derivative phylad within it. It shares the same basic head and body form, as well as the same general pattern of rugoreticulate sculpturing, as members of the *fallax* group. Its distinguishing features are the flattened basal portion of the antennal scape and consistently broad occiput of the minor worker (a slight deviation in the latter character occurs in *erethizon* and *guerrerana*). All of the known *crassicornis*-group species are Nearctic, ranging among themselves variously from the southeastern United States to the southern reaches of the Mexican Plateau. (Two Neotropical species, *claviscapa,* placed in the *fallax* group, and *laticornis,* placed in the *diligens* group, also have broadened scapes but are excluded from the *crassicornis* group because their minor workers have narrowed occiputs with well-developed posterior nuchal collars. Three other species placed here in the *crassicornis* group, namely *erethizon, fariasana, guerrerana,* and *spathicornis,* may belong phylogenetically in the *fallax* group, as evidenced by the head shape and sculpture of the major caste. In other words, the basal flattening of the scape may be a trait subject to easy convergence.)

1 Occiput of major and minor rugoreticulate (Texas) (placed in the *fallax* group; also keyed out here to ensure identification) ..... ***texana***

Occiput of major and minor smooth, carinulate, or foveolate, not rugoreticulate **2**

2 Occiput of major carinulate (Colorado, southwestern U. S.) (placed in the *fallax* group; also keyed out here to ensure identification) ..... ***cockerelli***

Occiput of major smooth or foveolate **3**

3 Major: parallel longitudinal carinulae covering anterior three-fourths of head capsule, leaving only the occiput bare. Minor: all but posterior quarter of the first gastral tergite shagreened and subopaque (Hidalgo, Mexico) ..... ***pinicola***

Major: parallel longitudinal carinulae covering at most the anterior two-thirds of head capsule. Minor: at most only the anterior fringe of the first gastral tergite shagreened, the remainder bare and shiny **4**

4 First gastral tergite of major in profile devoid of pilosity or nearly so, at most with 1–3 hairs projecting above margin **5**

First gastral tergite of major in profile with abundant hairs **6**

5 Major: in full-face view, profile of occipital lobes subangulate, coming together at midline of head in a deep cleft that is also subangulate. Minor: longitudinal carinulae extend posteriorly past eye (Texas) ..... ***bureni***

Major: in full-face view, occipital lobes broadly rounded, coming together at midline of head in a rounded median cleft. Minor: longitudinal carinulae do not extend posteriorly beyond eye (southeastern U. S. and Texas) ..... ***crassicornis***

6(4) Major: hairs on dorsum of first gastral tergite very long, many exceeding 1.5× the maximum length of the eye **7**

Major: hairs on dorsum of first gastral tergite short, at most slightly exceeding the maximum length of the eye **11**

7 Major: almost all of the sculpturing on the dorsum of the head posterior to the level of the eye and exclusive of the occipital lobes consists of rugoreticulum (south-central Mexico) **8**

Major: almost all of the sculpturing on the dorsum of the head posterior to the level of the eye consists of carinulae **9**

8 Major: lateral margins of postpetiole seen from above angulate. Minor: head bicolored, yellow and yellowish brown; occiput narrow, with nuchal collar (Guerrero) ..... ***guerrerana***

Major: lateral margins of postpetiole seen from above concolorous reddish yellow; occiput broad, lacking nuchal collar (Morelos) ..... ***spathicornis***

9(7) Major: entire head, up to and including occiput, foveolate and opaque (Michoacan, Mexico) ..... ***erethizon***

Major: most of posterior half of head of major smooth and shiny **10**

10 Major: carinulae in middle of dorsum of head extends posteriorly to half the distance from the level of the eye to the level of the occipital border. Minor: dorsal surface of head and pronotum foveolate and opaque (Arizona) ..... ***vallicola***

Major: carinulae in middle of dorsum of head extending posteriorly only one-fourth the distance from the level of the eye to the occipital border (Tamaulipas, Mexico) ..... ***fariasana***

11(6) Major: seen in profile, first gastral segment with approximately 10 scattered, medium-length hairs that project above the margin; head light reddish brown, with a large, fuzzy-edged dark brown spot on the vertex (San Luis Potosí, Mexico) ..... ***coracina***

Major: seen in profile, first gastral segment covered with a dense felt of short to medium hairs projecting above the margin; color variable, with no spot on the vertex **12**

12 Major: seen from side, waist, and first gastral tergite with hairs that are mostly as long as half the maximum eye length or slightly longer; hairs always present on occiput **13**

Major: seen from side, waist, and first gastral tergite with hairs that are mostly shorter than half the maximum eye length or (on waist) absent; hairs present or absent on occiput **14**

13 Major: occipital corners in full-face view subangulate. Minor: sides of head bare and shiny along their entire length (Texas) ..... ***pilosior***

Major: occipital corners in full-face view smoothly rounded, forming semi-circles. Minor: sides of head foveolate and opaque (Missouri to Arizona) ..... ***tetra***

14(12) Major: hairs projecting beyond dorsal margin of first gastral tergite constitute a mixture of very short and medium-length hairs; no hairs on occiput; rugoreticulum mesad to the eye reaching halfway between eye and anterior margin of head; color medium reddish brown. Minor: sides of head foveolate and opaque (Texas to Arizona) ..... ***diversipilosa***

Major: hairs projecting beyond dorsal margin of first gastral tergite almost all very short and uniform in length; numerous hairs on occiput; rugoreticulum mesad to the eye reaching at most the level of the anterior margin of the eye (Texas) ..... ***porcula***

The *diligens* Group

This large and diverse assemblage, almost exclusively Neotropical in distribution (I have recently seen one still undescribed species from the Patagonia Mountains of southern Arizona), comprises species of medium size, approximately heart-shaped heads, prominent mesonotal convexities, and restricted, mostly nonreticulate sculpturing. The *diligens* group is contiguous and even overlapping with the *fallax* group in the variation of these traits taken singly, but in the great majority of cases nest series can be placed in one or the other of the two groups by glancing at the full suite of characters. On the other hand, whether the group is monophyletic or a cluster of convergent subgroups remains to be determined. (One species, *riveti* of Ecuador, cannot be keyed precisely here because the antennae of the lectotype are missing; check this species directly at decision points as noted in the key.)

1	Propodeal spine greatly broadened and shortened or lacking altogether in the major and usually in the minor also; rather, the basal and descending faces of the propodeum viewed from the side come together to form a low, obtuse, or right angle	**2**
	Propodeal spine present in major and minor, at least in the form of a denticle or small, raised acute angle	**10**
2	Major: antennal scape reaches or slightly exceeds the occipital corner	**3**
	Major: antennal scape fails to reach the occipital corner by at least twice its own maximum width (also, check *riveti*)	**4**
3	Major: scape slightly exceeds occipital corner; occipital corner in full-face view subangular, not forming arc of circle (Amazonian Brazil, Paraguay)	***chrysops***
	Major: scape falls slightly short of occipital corner; occipital corner smoothly rounded to form the arc of a circle (Bolivia)	***vafella***
4(2)	Major: most of dorsal surface of head capsule covered by longitudinal carinulae	**5**
	Major: carinulae of head capsule almost entirely limited to small area near the eyes	**6**
5	Mesosoma of major and minor largely covered by transverse carinulae (Colombia) (also, check *riveti*)	***laelaps***
	Mesosoma of major and minor lacking transverse carinulae (Amazonian Peru)	***demeter***
6(4)	Pronotum and posterior dorsal half of head of minor partly covered by transverse carinulae (Costa Rica to Colombia)	**7**
	Pronotum and posterior dorsal half of head of minor lacking carinulae, and instead is entirely smooth and shiny	**8**
7	Major: carinulae originating at inner side of eye travel transversely to the top of the antennal fossa. Minor: head possesses nuchal collar (Colombia)	***seligmanni***
	Major: carinulae originating at inner side of eye travel anteriorly to the anterior margin of the head capsule. Minor: head lacks nuchal collar (Costa Rica to Colombia)	***alfaroi*** **(in part)**

8(6) Major: head elongate (Head Length 1.2× Head Width). Minor: in side view, basal face of propodeum joins descending face in a smooth curve (Brazilian Amazon) ..... ***strigosa***

Major: head not elongate (Head Length less than 1.1× Head Width). Minor: juncture of basal and descending propodeal faces in side view bearing short spine or at least angulate (Costa Rica) **9**

9 Major: scape broadened near the base, its width there equal to or greater than the maximum width of the transects along its distal half. Minor: dorsal surface of propodeum lacks transverse carinulae ..... ***laticornis***

Major: scape much narrower near its base than in transects along its distal half. Minor: dorsal surface of propodeum covered by transverse carinulae ..... ***diana***

10(1) Major: scape reaches within half of its own maximum width of the occipital corner, or exceeds it **11**

Major: scape fails to reach occipital corner by at least half its own maximum width **30**

11 Major: carinulae and other sculpturing immediately laterad to the frontal lobes (i.e., for a distance laterad equal to the Eye Length) either not extending beyond the level of posterior margin of the eye or, if they do, extending at most for a distance less than half the length of the eye; surface of head immediately laterad to the eye and posterior to it smooth and shiny **12**

Major: carinulae and other sculpturing immediately laterad to the frontal lobes extending posteriorly past the posterior eye margin for a distance greater than the Eye Length; surface of head immediately laterad to the eye and posterior to it often sculptured **26**

12 Major: profile of mesosoma completely bare of pilosity or at most with several standing hairs **13**

Major: profile of mesosoma with abundant standing hairs **15**

13 Major and minor: mesopleuron foveolate only, lacking carinulae and rugulae; scape exceeding margin of occipital corner by its length or slightly more; yellow (Brazilian Amazon) ..... ***lemur***

Major and minor: mesopleuron with weak but distinct longitudinal carinulae or rugulae; scapes of major just reaching margin of occipital corner; dark brown (Central America) **14**

14 Major: space between eye and antennal insertion partly rugoreticulate; propodeal spine straight and tapered to a point (Honduras) ..... ***anima***

Major: space between eye and antennal insertion entirely carinulate, with no rugoreticulum; propodeal spine relatively thick and blunt-tipped (Guatemala) ..... ***tschinkeli***

15(12) Major: scape exceeds the occipital corner by at least 2× its own maximum width **16**

Major: scape just reaches the occipital corner, or extends beyond by no more than its own maximum width **19**

16 Major and minor: in side view, propodeal spine at least half as long as the basal face anterior to it **17**

Major and minor: in side view, propodeal spine less than one-fourth as long as the basal face anterior to it **18**

17 Major: eye very large, its maximum length greater than the distance from its anterior border to the genal border; frontal lobes longitudinally carinulate (Amazonian Peru)..... ***scimitara***

Major: maximum eye length much less than the distance from the anterior border of the eye to the genal border; frontal lobes smooth and shiny (Costa Rica)..... ***tanyscapa***

18(16) Major: occiput bearing a tuft of standing hairs conspicuously denser than the hairs on the main dorsal surface of the head; within the occipital tuft on the surface is a "crown" of scattered but conspicuous foveae; major reddish brown, minor brownish yellow (widespread circum-Caribbean, possibly tramp species)..... ***cocciphaga***

Major: occiput lacking a special tuft of hairs or foveae on occiput; major reddish yellow, minor yellowish brown (Venezuela, Amazonian Brazil)..... ***longiscapa***

19(15) Major and minor: in side view, propodeal spine as long as the basal face of the propodeum anterior to it (Costa Rica)..... ***sicaria***

Major and minor: in side view, propodeal spine less than one-fourth the length of the basal face anterior to it..... **20**

20 Major: all of mesothorax and petiole smooth and shiny except for small patches of weak foveolae and rugulae on the lower part of episternum and center of side of propodeum (Colombia)..... ***tenuis***

Major: almost all of mesothorax and petiole foveolate and opaque..... **21**

21 Major: several parallel carinulae run from each frontal lobe back over the head capsule to at least halfway between the level of the posterior border of the eye and the occipital border..... **22**

Major: carinulae from each frontal lobe reach at most a quarter of the distance from the level of the posterior border of the eye to the occipital border..... **23**

22 Major and minor: parallel transverse carinulae prominent on anterior fourth of pronotum and also present on dorsal surface of propodeum of major; all of the side of major mesothorax (mesopleuron) foveolate and opaque (Panama to Bolivia)..... ***veletis***

Major and minor: several broken transverse carinulae present on extreme anterior strip of pronotum, and absent elsewhere on mesosomal dorsum of major and minor; lower half of major mesopleuron smooth and shiny (São Paulo, Brazil)..... ***perryorum***

23(21) Small (Head Width of major 0.8 mm) brown species. Minor: eye large and placed forward, its length as great as the distance from eye to anterior genal border (Amazonian Peru)..... ***machetula***

Larger (Head Width of major 0.9–1.0 mm), brown or yellow species. Minor: Eye Length much less than the distance of anterior border of eye to the anterior genal border..... **24**

24 Major: in full-face view, no hairs project beyond the margin of head posterior to level of eyes; a small amount of rugoreticulum present, in addition to carinulae, between frontal lobe and eye (Santa Catarina, Brazil)..... ***laevifrons***

Major: in full-face view, dense hairs projecting beyond margin of head posterior to level of eyes; no rugoreticulum, only carinulae, present between frontal lobe and eye..... **25**

25 Major: scape exceeds occipital corner by its own maximum width; eye small, its length only 0.14 mm; yellow (Ceará, Brazil)..... ***rochai***

Major: scape just reaches occipital corner; eye length 0.20 mm; reddish brown (Santa Catarina, Brazil) (also, check *chrysops*)..... ***blumenauensis***

26(11) Major and minor: dorsal surfaces of promesonotum and propodeum covered by parallel transverse carinulae (Venezuelan tepui) ..... ***tepuicola***

Major and minor: dorsal surface of promesonotum and propodeum lack carinulae **27**

27 Major: head sparsely pilose; when head is viewed full face, at most several hairs project beyond the occipital border **28**

Major: head densely pilose; when head is viewed in full face, at least 10 and usually many more hairs project beyond the occipital border **29**

28 Major: extensive area between eye and antennal insertion rugoreticulate; anterior fourth of first gastral tergite shagreened and opaque. Minor: propodeal spine well developed, in profile half as long as the propodeal basal face anterior to it (Costa Rica) ..... ***variegata***

Major: area between eye and antennal insertion entirely carinulate, lacking rugoreticulum; all of first gastral tergite smooth and shiny. Minor: propodeal spine reduced to a tiny denticle (Coahuila, Mexico) ..... ***ariel***

29(27) Major: in full-face view, parallel transverse and curving carinulae run from the posterior ends of frontal carinae to the eye; mesonotal convexity in side view evenly rounded. Minor: light brown with violaceous reflections (Costa Rica) ..... ***violacea***

Major: in full-face view, carinulae originating from near posterior ends of frontal carinae run obliquely to a level well above the eye; mesonotal convexity in side view forming a blunt-tipped right angle. Minor: dark yellow, lacking violaceous reflections (Meta, Colombia) ..... ***spilota***

30(10) Major: sculpturing between eye and antennal fossa at least in part rugoreticulate, i.e., consisting in part of at least several cross-carinulae that connect adjacent longitudinal carinulae **31**

Major: no rugoreticulum between eye and antennal fossa, only concentric and longitudinal carinulae or unconnected rugulae **56**

31 Major: a large part of the dorsal surface of the head posterior to the level of the eyes weakly rugoreticulate as well as foveolate, and opaque (Costa Rica) ..... ***texticeps***

Major: no part of the dorsal surface of the head posterior to the level of the eyes bears a rugoreticulum **32**

32 Major: pilosity very sparse; no hairs project anywhere beyond margin of head viewed in full face, except those projecting beyond anterior margin of clypeus **33**

Major: pilosity moderately to very abundant; at least 5 or 6 hairs, usually many more, project beyond margin of head seen in full face, in addition to those at the anterior clypeal border **47**

33 Major: entire rear half of dorsal surface of head foveolate and opaque **34**

Major: rear half of dorsal surface of the head smooth and shiny, or at least the occiput and/or a broad central swath of the vertex smooth and shiny **39**

34 Major: in side view, rear third of petiole bears a low node and is bent downward at a nearly right angle to the anterior peduncle (Mato Grosso, Brazil) ..... ***cyrtostela***

Major: in side view entire petiole straight and surmounted posteriorly by a high, well-developed node **35**

35 Major: seen in side view, dorsal surface of first gastral tergite covered by dense felt of very short erect and suberect pubescence of even height, with a sparse scattering of much longer hairs; a pair of clavate hairs present on anterior dorsum of pronotum (Colombia)..... ***brandaoi***

Major: specialized pilosity described above not present..... **36**

36 Major and minor: median half of first gastral tergite shagreened and opaque for entire length of tergite; posterior strip of second gastral tergite also shagreened and opaque. Major and minor: yellow (El Salvador to Panama)..... ***pugnax***

Major and minor: at most only the anterior half of the median strip of the first gastral tergite shagreened and opaque, and the second gastral tergite entirely smooth and shiny. Major and minor: variously yellow to brown..... **37**

37 Major: gaster entirely smooth and shiny. Minor: head in full-face view narrowed somewhat posteriorly, with a convex occipital border and following nuchal collar (Ecuador) (placed in the *biconstricta* group; also keyed out here because of its unusual character state of 4 hypostomal teeth, instead of 2, and to ensure identification)..... ***plato***

Major: at least anterior third of median strip of first gastral tergite shagreened and opaque. Minor: head in full-face view not tapered, with a feebly concave occipital border and no nuchal collar..... **38**

38 Major: on the central dorsum of head, at least feeble carinulae extend to midpoint between eye level and occipital margin; anterior half of pronotum usually rugoreticulate; in side view, mesonotal hump and petiolar node narrowly convex; reddish brown to yellow (very abundant and widespread in parts of West Indies and in Central America and South America to Argentina, especially in disturbed habitats; may constitute a complex of sibling species)..... ***radoszkowskii***

Major: on the center of dorsum of head, carinulae extend only slightly behind eye level; at most, weak rugoreticulum present at rear of pronotal dorsum; in side view, mesonotal hump and petiolar node broadly convex, almost semicircular in outline. Major and minor: gaster light brown, rest of body dark yellow (Costa Rica)..... ***medialis***

39(33) Major: pronotal dorsum smooth and shiny..... **40**

Major: pronotal dorsum foveolate and opaque..... **44**

40 Major and minor: large (Head Width of major 1.6 mm) with long spines that equal in length the basal face of the propodeum anterior to it, viewed from the side; color very dark, from deep brown to black (Brazilian Amazon)..... ***lancifer***

Major and minor: smaller (Head Width of major 0.9–1.3 mm) with spines that are at most only slightly longer than half the length of the propodeal basal face anterior to it, in side view; color of species variously yellow to blackish brown..... **41**

41 Major: a strip from eye to occiput foveolate and opaque; body dark brown, gaster black. Minor: occiput broad, lacking nuchal collar (Mexico, Costa Rica)..... ***piceonigra***

Major: region between eye and occiput smooth and shiny; according to species, most of body yellow to reddish brown. Minor: according to species, body with or without nuchal collar..... **42**

42 Major: in full-face view, tip of scape reaches lateral margin of head much less than halfway from eye to occipital corner; humerus, in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view), subangulate; head tricolored, with clypeus yellow, space between clypeus and level of eye light brown, and rest of head dark reddish brown (Amazonian Peru) ..... ***davidsonae***

Major: in full-face view, tip of scape reaches lateral edge of head well above midpoint between eye and occipital corner; humerus, in dorsal-oblique view smoothly rounded; head concolorous yellow or brown **43**

43 Major: scape approaches occipital corner to a distance of less than its own maximum width; in side view, propodeal spine longer than half the length of the basal face of the propodeum anterior to it; body yellowish to medium reddish brown. Minor: occiput broad, lacking nuchal collar (Costa Rica, Panama) ..... ***perdiligens***

Major: scape approaches occipital corner to a distance about equal to twice its own maximum width; in side view, propodeal spine less than half as long as the basal face of the propodeum anterior to it; body dark brown. Minor: occiput narrow, with nuchal collar (Peruvian and Ecuadoran Amazon) ..... ***gagates***

44(39) Major: all of dorsal surface of head capsule except occiput foveolate and opaque; all of frontal lobes and region between them posterior to the frontal triangle covered by parallel longitudinal carinulae (Argentina) ..... ***nubila***

Major: at most only the anterior half of the dorsal head surface foveolate and opaque, the remainder smooth and shiny; a wide central space between frontal-lobe carinulae is smooth and shiny **45**

45 Major: propodeal spine thin, needle-like, one-third as long as the dorsal face of the propodeum anterior to it. Minor: head narrowed posteriorly, with thin nuchal collar (Santa Cruz, Bolivia) ..... ***zelata***

Major: propodeal spine thick, in side view, roughly equilateral-triangular in shape, only one-fourth as long as the dorsal face of the propodeum anterior to it. Minor: occiput broad, its border shallowly concave, lacking nuchal collar **46**

46 Major: promesonotal profile, in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view), contains 3 prominent convexities, 2 pronotal and one mesonotal. Minor: frontal lobes lack carinulae. Major and minor: yellow (Argentina, Bolivia, Brazil) ..... ***triconstricta***

Major: promesonotal profile, in dorsal-oblique view, contains only 2 prominent convexities, the pronotal and mesonotal respectively. Minor: frontal lobes possess longitudinal carinulae along outer edges. Major: light brown, anterior quarter of head capsule reddish yellow. Minor: medium brown (Minas Gerais, Brazil) ..... ***geraesensis***

47(32) Major: pronotal dorsum foveolate and opaque **48**

Major: pronotal dorsum smooth and shiny **49**

48 Major: scape falls short of occipital corner by only 1× its own maximum width; longest hairs on dorsa of pronotum and gaster 2× length of eye. Minor: occiput narrowed behind, with thin nuchal collar (Costa Rica) ..... ***hoelldobleri***

Major: scape falls short of occipital corner by 2× its own maximum width; longest hairs on dorsa of pronotum and gaster only about as long as length of eye. Minor: occiput broad behind, and lacks nuchal collar (southern and central Brazil) ..... ***rufipilis***

49(47) Major and minor: in side view, many hairs on the dorsa of head and gaster are 2× (and some 3×) length of eye (Brazilian and Amazonian Peru)..... ***longiseta***

Major and minor: in side view, at most only several hairs as long as 2× the length of the eye, the great majority much shorter..... **50**

50 Major: longitudinal carinulae immediately mesad to eyes extending one-fourth or more the distance to the occipital border..... **51**

Major: longitudinal carinulae immediately mesad to eyes not reaching beyond the posterior border of the eyes..... **52**

51 Major: longitudinal carinulae immediately mesad to eyes reaching halfway to occipital border; sides of mesonotal convexity and propodeum just above and in front of the spiracle carinulate (Argentina, southern Brazil)..... ***laevinota***

Major: longitudinal carinulae immediately mesad to eyes reaching only one-fourth distance to occipital border; sides of mesonotal convexity and area above and front of propodeal spiracles lacking carinulae (Argentina) (placed in the *fallax* group; also keyed out here to ensure identification)..... ***pampana***

52(50) Major: in side view, dense layers of hairs project beyond both the dorsum and venter of the first gastral tergite, and in full-face view a similar dense fringe of hairs project from around the entire margin of the head (Argentina) (placed in the *fallax* group; also keyed out here to ensure identification)..... ***dione***

Major: in side view, hairs are sparse along the profiles of the above segments, usually fewer than 10 on each tergite..... **53**

53 Major: anterior fourth of first gastral tergite shagreened and opaque; in side view, propodeal spine more than half as long as the length of the basal face of the propodeum anterior to it. Minor: in full-face view, rear half of head strongly narrowed, with a conspicuous nuchal collar (Suriname, Amazonian Brazil)..... ***coffeicola***

Major: anterior fourth of first gastral tergite smooth and shiny; in side view, propodeal spine no more than one-third as long as the length of the basal face anterior to it. Minor: in full-face view, rear half of head only slightly or moderately narrowed, with at most a very thin, inconspicuous collar..... **54**

54 Major: in side view, mesonotal convexity low, its length across the base 2× its height; propodeal spine short and blunt, approximately the shape of an equilateral triangle. Major and minor: clear dark yellow (southeastern Brazil)..... ***peregrina***

Major: in side view, mesonotal convexity very prominent, approaching equilateral triangle in outline; propodeal spine longer and sharp, forming an acute triangle. Major and minor: yellowish brown to medium brown..... **55**

55 Major: lower half of mesopleuron foveolate and opaque; anterior half of pronotal dorsum with several short transverse rugulae; yellowish brown, gaster a shade darker than rest of body. Minor: head narrowed somewhat posteriorly, with an inconspicuous nuchal collar (Colombia, Bolivia)..... ***seeldrayersi***

Major: lower half of mesopleuron smooth and shiny; pronotal dorsum lacking carinulae; reddish brown. Minor: head not tapered posteriorly and lacking a nuchal collar (Argentina and southern Brazil) (placed in the *fallax* group; also keyed out here to ensure identification; see also the closely similar *eidmanni* in the *fallax* group)..... ***nitidula***

56(30) Major: in side view, rear third of petiole bearing a low node and bent downward at nearly a right angle to the anterior peduncle (Amazonian Brazil) ..... ***camptostela***

Major: in side view entire petiole straight and surmounted by a high, well-developed node **57**

57 Major: mesonotum and basal face of propodeum covered by parallel transverse carinulae **58**

Major: mesonotum and usually also the basal face of propodeum lacking transverse carinulae **59**

58 Major: entire dorsal surface of head posterior to eye level covered by parallel longitudinal carinulae. Minor: dorsal surface of head posterior to eye level lacking carinulae; occiput possesses a nuchal collar (Chile)..... ***chilensis***

Major: dorsal surface of head posterior to eye level lacking carinulae, instead smooth and shiny. Minor: dorsal surface of posterior half of head with transverse carinulae; occiput lacks a nuchal collar (Costa Rica to Colombia)..... ***alfaroi*** **(in part)**

59(57) Major: viewed in full face, carinulae originating on the frontal lobes curve 45 degrees outward from the lobes just posterior to the eye level and continue on (like "eyebrows") over the eyes to the edges of the head; posterior third of dorsum of head capsule covered with widely spaced but conspicuous foveae, its surface otherwise smooth and shiny; media caste (between major and minor) present (Costa Rica)..... ***boruca***

Major: carinulae originating on frontal lobes do not curve outward in "eyebrow" pattern; dorsal third of head lacks coarse foveae; media caste absent **60**

60 Major: dorsal surface of head, including occiput, and all of the mesosoma foveolate, and opaque to subopaque; pilosity very sparse, with no hairs showing beyond margin of head, except for anterior margin of clypeus, when viewed in full face **61**

Major: at least the occiput and usually large portions of the pronotum smooth and shiny; pilosity varies among species **66**

61 Major: head bicolored, with occiput, sides of head, posterior strip of clypeus, and antennal fossae brown, and rest of surface yellow. Queen: head with similar color pattern, and abdomen phragmotic (Brazil, Ecuador, Peru) ..... ***embolopyx***

Major: head more or less uniformly colored, lacking the unique pattern above. Queen: abdomen not phragmotic..... **62**

62 Major: first gastral tergite entirely smooth and shiny **63**

Major: at least the anteriormost strip of first gastral tergite shagreened and subopaque to opaque **64**

63 Major: pronotal dorsum entirely covered with transverse carinulae. Minor: occiput in full-face view broad, lacking nuchal collar (Colombia, Venezuela)..... ***subnuda***

Major: pronotal dorsum with at most carinulae at anterior margin. Minor: occiput in full face narrowed, with nuchal collar (Colombia, Nicaragua)..... ***sagax***

64(62) Major: only the anterior fringe of the median strip of first gastral tergite shagreened and opaque; apex of petiolar node in side view tapering to a blunt point (Brazil, Peru)..... ***diligens***

Major: entire median strip of first gastral tergite shagreened and opaque; apex of petiolar node in side view rounded..... **65**

65 Major: carinulae on frontal lobes limited to outer edges of the lobes, leaving a wide space between them covered only by foveolae. Major and minor: propodeal spine oriented strongly backward, forming in side view an angle of about 145 degrees with the propodeal basal face (central Brazil)..... ***fowleri***

Major: entire surface of the frontal lobes covered by parallel longitudinal carinulae. Major and minor: in side view, propodeal spine "stands up" from the basal propodeal face, forming an angle with it of about 135 degrees (Panama)..... ***hierax***

66(60) Major: at least the anteriormost strip of the first gastral tergite shagreened and opaque..... **67**

Major: first gastral tergite entirely smooth and shiny **68**

67 Major: in dorsal-oblique view (mesosoma rotated around long axis from top view), pronotum with angulate "sharkfin" protrusion; shagreening on first gastral tergite limited to anteriormost strip. Minor: occiput narrow, with nuchal collar (Colombia)..... ***venatrix***

Major: in dorsal-oblique view, pronotum smooth, rounded, lacking angulate protrusion; shagreening covers at least the anterior half of the first gastral tergite. Minor: occiput broad, lacking nuchal collar (Colombia, Curaçao)..... ***inversa***

68(66) Major: the parallel longitudinal carinulae immediately mesad the eye extend posteriorly past the eye for a distance at least as long as the length of the eye itself..... **69**

Major: parallel longitudinal carinulae immediately mesad to the eye, if present at all, do not extend posteriorly past the eye or, if they do, the extent is less than the length of the eye itself..... **76**

69 Major: carinulae mesad to the eye extend posteriorly beyond the midpoint between level of posterior eye margin and occiput, where they break up into a patchwork of weak rugoreticulum; head bicolored, its anterior fifth brownish yellow and remainder light brown (Costa Rica)..... ***prostrata***

Major: carinulae mesad to the eye extend posteriorly at most to the midpoint between posterior level of eye margin and occiput, and do not break up anywhere into a rugoreticulum; head a single color **70**

70 Major and minor: extensive parallel transverse carinulae present on pronotum and mesopleuron. Major: viewed from the side, anterior third of lower surface of postpetiole bulges forward as a lobe (montane Colombia) (placed in the *tristis* group; also keyed out here to ensure identification)..... ***gaigei***

Major and minor: at most, several transverse carinulae present on anterior half of major pronotum, and always absent in minor; anterior convexity weak or absent on postpetiolar ventral margin..... **71**

71 Major: in profile, propodeal spine longer by at least half the length of the propodeal basal face anterior to it. Minor: pale yellow (desert, Dominican Republic)..... ***noar***

Major: in profile, propodeal spine only one-fourth as long as the basal propodeal face anterior to it **72**

72 Large species (Head Width of major 1.9 mm). Major: frontal lobes covered by dense longitudinal carinae. Minor: conspicuous nuchal collar present (Brazil, Paraguay, Argentina)..... ***oxyops*** **(in part)**

Small to medium-sized species (Head Width of major at most 1.1 mm). Major and minor both lack transverse carinulae on pronotum. Major: only 10 or fewer widely spaced longitudinal carinae on frontal lobes. Minor: nuchal collar either present or absent..... **73**

73 Small, slender species (Head Width of major less than 1.0 mm). Major: carinulae around midline of dorsal surface of head extend all the way to the occiput. Minor: nuchal collar present **74**

Large, relatively stout species (Head Width of major 1.0 mm or more). Major: carinulae around midline of dorsal surface of head extend less than halfway from level of eye to occiput. Minor: nuchal collar absent **75**

74 Major: propodeal spine well developed; carinulae immediately mesad to the frontal carinae reach only halfway from the level of the eye to the occiput (widespread, tropical South America) ..... ***cataractae***

Major: propodeal spine reduced to a denticle; carinulae immediately mesad to the frontal carinae reach three-fourths the way from the level of the eye to the occiput (Colombia) ..... ***calimana***

75(73) Major: parallel transverse carinulae present on anterior fifth of pronotum; in side view, profile of the posterior third of the pronotum is elevated slightly but distinctly above the anterior two-thirds by a short face (Galápagos) ..... ***williamsi***

Major: carinulae absent from pronotum; in side view, dorsal profile of pronotum forms a smooth convex curve (Lima, Peru) ..... ***crozieri***

76(68) Major: profile of dorsa of mesosoma, petiole, and postpetiole, as well as of the circumference of sides of head and occiput, completely devoid of pilosity **77**

Major: profile of above body parts with numerous hairs projecting beyond their margins **79**

77 Major and minor: in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view), outline of pronotum constitute a double convexity (Grenada, West Indies, and Brazil) ..... ***bruesi***

Major and minor: in dorsal-oblique view, outline of pronotum consists of a single, subangular convexity **78**

78 Major: scape approaches occipital corner to within a distance 1× its own maximum width; light reddish brown, with a medium brown spot on the vertex (Ecuador) ..... ***stigma***

Major: scape fails to reach the occipital corner by 3× its own maximum width; concolorous pale yellow (Brazilian and Peruvian Amazon) ..... ***laidlowi***

79(76) Major: pilosity over dorsal surface of body very long, some of the hairs exceeding 2× the length of the eye **80**

Major: pilosity over dorsal surface only moderately long, with few if any of the hairs reaching 1.5× the length of the eye, and most or all not as long as the eye **82**

80 Major: pronotal dorsum covered by parallel transverse carinulae, the interstices foveolate and opaque (Rio de Janeiro, Brazil) ..... ***reichenspergeri***

Major: pronotal dorsum at most with several transverse carinulae on its anterior third, and all the remaining surface smooth and shiny **81**

81 Major: dorsum of first gastral tergite seen in side view bearing a small number of very long hairs along its margin, many over 2× Eye Length. Minor: occiput narrow, bearing a posterior nuchal collar (Brazil, Colombia) ..... ***pubiventris***

Major: dorsum of first gastral tergite in side view covered by a dense layer of hairs of highly variable length, none over 1.5× Eye Length. Minor: occiput broad and lacks a posterior nuchal collar (Costa Rica to southern Brazil) ..... ***sensitiva***

82(79) Major and minor: propodeal spine very thin, sharp, and needle-like; head long and narrow (Head Length 1.16× greater than Head Width in major and 1.33× greater in minor) (Amazonian Peru) ..... ***aciculata***

Major and minor: propodeal spine not needle-like; head shorter in proportion (Head Length 1.00–1.10× greater than Head Width in major and 1.07–1.23× in minor) **83**

83 Major: in side view, dorsa of head and first gastral tergite covered by dense, appressed hairs, many of which are aligned almost parallel to the surface of the segments **84**

Major: in side view, dorsa of head and first gastral tergite bearing mostly suberect to erect hairs **85**

84 Major: in side view, hairs of first gastral tergite shorter than half the length of the eye; hypostomum bearing 4 teeth. Minor: occiput broad, lacking nuchal collar (Ecuador) ..... ***cameroni***

Major: in side view, most hairs of first gastral tergite as long as the eye; hypostomum bearing 2 teeth. Minor: occiput narrow, with nuchal collar (upland Costa Rica) ..... ***biolleyi***

85(83) Major and minor: when the propodeal dorsum is seen in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view), a convexity appears at the center of the edge of its basal face that is nearly as high as the propodeal spine; propodeal spine small, only a tenth as long as the propodeal basal face anterior to it. Major: viewed from above, the outer edges of the postpetiole are subangular. A larger species (Head Width of major 1.4 mm) (Bolivia) ..... ***quiaccana***

Minor and major: lacking convexity on oblique outer edge of propodeal basal face; spine length variable. Major: seen from above, outer edges of postpetiole evenly rounded. Smaller species (Head Width of major 1.0–1.3 mm) **86**

86 Major and minor: mesonotal convexity very low, nearly absent in minor, and in both castes its length is 8× or more its height **87**

Major and minor: mesonotal convexity prominent, its length 5× or less its height **88**

87 Major: erect hairs forming a dense fringe around the head viewed in full face; propodeal spine half as long as the basal propodeal face anterior to it (montane Ecuador) ..... ***alpestris***

Major: exclusive of clypeus, pilosity around edge of head viewed in full face sparse, consisting of only 10 or so erect and suberect hairs; propodeal spine less than half as long as the basal propodeal face (montane Peru) ..... ***accinota***

88(86) Major: tip of scape touches the border of the head midway between level of the posterior margin of the eye and level of the occiput **89**

Major: tip of scape touches the border of the head two-thirds or more from level of the posterior margin of the eye to the level of the occiput **90**

89 Large species (Head Width of major about 1.9 mm); head capsule concolorous light reddish brown. Minor: occiput narrow, with a nuchal collar (Brazil, Paraguay, Argentina) ..... ***oxyops*** **(in part)**

Smaller species (Head Width of major about 1.3 mm); head capsule bicolored, its anterior one-third yellowish brown and its posterior two-thirds medium brown. Minor: occiput broad, lacking nuchal collar (Costa Rica) ..... ***indistincta***

90(88) Major: scape approaches occipital corner within 1× of its own maximum width; Head Length only 1.02× greater than Head Width. Major and minor: clear yellow (southeastern Brazil) ..... ***angusta***

Major: scape falls short of occipital corner by at least 2X its own maximum width; Head Length 1.08–1.10× Head Width. Major and minor: light to medium brown **91**

91 Major: dorsal surfaces of head and pronotum in side view covered by dense mat of erect hairs; in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view), profile of pronotum is a smooth convexity; head capsule faintly bicolored, with anterior third yellowish brown and posterior two-thirds a slightly contrasting light brown (widespread in disturbed habitats from Santa Catarina in Brazil to Trinidad and Costa Rica) ..... ***vafra***

Major: dorsal surfaces of head and pronotum in side view with sparse pilosity, constituting no more than 20 hairs on each of these two surfaces; in dorsal-oblique view, profile of pronotum is shallowly bilobed; head capsule concolorous medium reddish brown (Veracruz, Mexico) ..... ***mooreorum***

The *distorta* Group

This group, marked by the bizarre head and mesosoma of the major caste as well as the heavy rugoreticular sculpturing of both its head and mesosoma, most closely resembles the *tristis* group. Nowhere common, species of the *distorta* group range variously from Panama to Argentina.

1 Major and minor: lacking propodeal spines; instead, the basal and descending faces of the propodeum seen from the side meet to form a right or obtuse angle; the promesonotum in side view rises to form an extremely elevated hump that descends posteriorly through a face as long as the adjacent basal face of the propodeum (Colombia) ..... ***distorta***

Minor: has well-developed propodeal spine. Major (in those species where it is known) also has a well-developed propodeal spine, and the posterior face of the promesonotum is shorter than the basal face of the propodeum in side view **2**

2 Minor: with huge propodeal spine, as long as or longer than the basal face of the propodeum anterior to it, seen from the side **3**

Minor: with ordinary propodeal spine, shorter than the basal face of the propodeum anterior to it, seen from the side **4**

3 Minor: occiput and pronotum rugoreticulate; anterior fourth of first gastral tergite longitudinally striate (Amazonian Brazil) ..... ***deima***

Minor: occiput smooth in center; pronotum carinulate, first gastral tergite foveolate but not striate (tropical South America) ..... ***dolon***

4(2) Minor: dorsal surface of head posterior to frontal lobes smooth and shiny ..... ***reclusi***

Minor: most or all of dorsal surface of head posterior to frontal lobes carinulate or rugoreticulate **5**

5 Minor: dorsal surface of head bears extensive rugoreticulation above and mesad to the eye (Argentina, Bolivia) ..... ***scapulata***

Minor: dorsal surface of head bears only longitudinal carinulae **6**

6 Minor: dorsal surface of head, including occiput, completely covered with longitudinal carinulae; dorsa of major petiole and postpetiole rugoreticulate (Mato Grosso, Brazil) ..... ***monstrosa***

Minor: occiput smooth and shiny, and most of rest of dorsal surface of head bears longitudinal carinulae; dorsa of major petiole and postpetiole carinulate, not rugoreticulate (Brazil, Ecuador) ..... ***bufo***

The *fallax* Group

This large assemblage is matched only by the *flavens* group in breadth of geographic distribution. Its species range collectively from the southeastern United States to Argentina, both throughout the mainland and on most of the larger islands of the West Indies. Its signature traits are medium size (with the major Head Width of the great majority of species falling between 1.0 and 2.0 mm), relatively long antennal scapes, sides of the major head subparallel, well-developed mesonotal convexity in both major and minor, dense pilosity, and relatively heavy sculpturing, which includes some rugoreticulation on at least the head of the major.

Two species placed in the *fallax* group known only from the minor caste, *aequiseta* and *xanthogaster,* cannot be identified with the key to follow. Specimens should be checked directly with the figures and measurements provided in the main section of species diagnoses.

1 Major: seen in full-face view, entire dorsal surface of head, including occipital lobes, covered by carinulae, or rugulae, or rugoreticulum, or some combination of these three types of sculpturing **2**

Major: seen in full-face view, either the occipital lobes and/or much of the rest of the posterior half of the head as well, are free of carinulae, rugae, and rugoreticulum, and are instead either smooth or densely foveolate **25**

2 Major: scape in repose approaches the occipital corner by 2× or less its own maximum width, or reaches it, or exceeds it **3**

Major: scape fails to reach the occipital corner by more than 2× its own maximum width **12**

3 Major and minor: in side view, propodeal spine at least three-fourths as long as the basal face of the propodeum directly anterior to it (Costa Rica) **4**

Major and minor: in side view, propodeal spine at most one-third as long as the basal face of the propodeum directly anterior to it **5**

4 Major: all of promesonotum covered by parallel transverse carinulae; lower half of mesopleuron covered by parallel longitudinal carinulae; color of body dark brown. Minor: pronotum smooth and shiny ..... ***ajax***

Major: transverse carinulae limited on promesonotum to anterior third of pronotum, rugulae present on remainder; carinulae absent from mesopleuron; body reddish yellow to dark brown. Minor: most of pronotum foveolate and opaque ..... ***fiorii***

5(3) Major: rugoreticulum mesad to eye extending all the way posteriorly to the occipital border **6**

Major: rugoreticulum mesad to eye if present limited to space between eye and antennal fossa or at most extending posteriorly two-thirds the way from the eye to the occiput **8**

6 Major: propodeal spine well developed, its height about equal to its width at the base; in side view the dorsal profile of the petiole forms a straight line from just behind the spiracle to the summit of the node; transverse carinulae absent from the mesonotum (Veracruz, Mexico) ..... ***confoedusta***

Major: propodeal spine low and triangular, its height less than its width at the base; in side view the dorsal profile of the petiole is concave, rising from just behind the spiracle to form a distinct anterior face of the node; transverse carinulae present on mesonotum **7**

7 Major: scape just reaching the occipital corner; only the anterior fourth of the median strip of the first gastral tergite is shagreened and opaque (Santa Catarina, Brazil) ..... ***lucretii***

Major: scape exceeding the occipital corner by more than its own maximum width; all of the median strip of the first gastral tergite shagreened and opaque (Amazonian Peru) ..... ***leonina***

8(5) Trimorphic species, with major, supermajor, and minor castes. Major: dorsal surface of head entirely carinulate, lacking rugoreticulum (supermajor: dorsal half of head with scattered foveae, and lacking carinulae) **9**

Dimorphic species, with no supermajor caste. Major: at least some of the space between the eye and antennal fossa rugoreticulate **10**

9 Supermajor: foveae in posterior half of dorsum of head elongate and parallel in direction, their axes oriented longitudinally (southern Arizona through the mountains of western Mexico) (placed in the *pilifera* group; also keyed out here to ensure identification) ..... ***obtusospinosa***

Supermajor: foveae on posterior half of dorsum of head circular in shape (mountains and high plateaus of central and eastern Mexico) (placed in the *pilifera* group; also keyed out here to ensure identification) ..... ***hirtula***

10(8) Major: rugoreticulum mesad to the eye extends slightly more than halfway from eye to level of occipital border. Minor: pronotum and posterior half of dorsal surface of head smooth and shiny (Minas Gerais, Brazil) ..... ***cardinalis***

Major: rugoreticulum mesad to the eye limited to space between the eye and antennal fossa. Minor: pronotum and most or all of posterior half of dorsal surface of head foveolate and opaque **11**

11 Major: carinulae of dorsal surface of the head sparse, and many of the intercarinular spaces smooth and shiny; some of the hairs on the occiput spatulate. Minor: many of the rather sparse hairs on the dorsal profile of the mesosoma, petiole, and postpetiole are spatulate (Costa Rica) ..... ***spathipilosa***

Major: carinulae on dorsal surface of head dense, with intercarinular spaces all foveolate and opaque. Major and minor: spatulate hairs lacking anywhere on body (Jamaica) ..... ***caribbaea***

12(2) Major: at least the rear third of the dorsum of the head covered by rugoreticulum **13**

Major: at least most of the occiput and often most or all of the rest of the dorsum of the head covered by carinulae, not a rugoreticulum **17**

13 Major: humeri armed with prominent angular extensions that extend beyond the margins of the pronotum when viewed from directly above (Panama) ..... ***caltrop***

Major: humeri not armed **14**

14 Major: pronotum rugoreticulate (Nicaragua)..... ***gulo***

Major: pronotum transversely carinulate..... **15**

15 Major: dorsum of head mesad to the eyes and proceeding to a level well in advance of the eyes rugoreticulate; sides of pronotum carinulate. Minor: propodeum with well-developed spine (Argentina, Paraguay, introduced into Gulf Coast of Alabama and Florida)..... ***obscurithorax***

Major: areas mesad and anterior to the eyes carinulate only, not rugoreticulate; sides of pronotum carinulate or not. Minor: propodeal spine present or absent..... **16**

16 Major: lower halves of pronotum and mesopleuron and anterior third of side of propodeum transversely carinulate. Minor: lacking propodeal spines; occiput transversely carinulate (Chocó, Colombia)..... ***tigris***

Major: lower halves of mesopleuron and pronotum and anterior third of side of propodeum foveolate only, lacking carinulae. Minor: propodeal spines present; occiput rugoreticulate (Texas)..... ***texana***

17(12) Major: dorsum of occiput covered by concentric semicircular carinulae that run parallel to the borders of the occipital lobes (Minas Gerais, Brazil)..... ***arcifera***

Major: dorsum of occiput covered by parallel longitudinal carinulae that do not curve parallel to the occipital lobes..... **18**

18 Major: carinulae originating on the frontal lobes continue unbroken posteriorly to the occipital border..... **19**

Major: at least some of the carinulae originating on the frontal lobes break up into a rugoreticulum before reaching the occipital border..... **22**

19 Major: in full-face view, profile of entire half of the head posterior to the eyes ringed by a uniform, dense fringe of short, semirecumbent hairs; rugoreticulum on head limited to a very small area (not much greater in extent than the area of the eye) just mesad of the circular carinulae around the antennal fossae (Costa Rica)..... ***mantilla***

Major: hairs around full-face margin of head posterior to the eyes erect to suberect, very variable in length, not forming a uniform fringe; rugoreticulum at the very least extending from the circular carinulae around the antennal fossae all the way to the eye..... **20**

20 Major: carinulae on the genae (laterad to the eye) extending only halfway from the level of the posterior margin of the eye to the level of the occipital lobes; in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view), the pronotal profile forms the arc of a circle and is only about as high as the mesonotal convexity behind it. Minor: dorsal surface of head and all of pronotum foveolate and opaque (southwestern U. S., Colorado) (also, check *hyatti*)..... ***cockerelli***

Major: carinulae on the genae extend posteriorly all the way to the level of the occipital lobes; in dorsal-oblique view, the pronotal profile bulges upward as a rounded right angle much higher than the mesonotal convexity behind it. Minor: dorsal surface of head and most or all of pronotum smooth and shiny..... **21**

21 Major and minor: in profile, petiolar node very prominent, its summit running anteriorly through a strong concavity to the peduncle and dropping posteriorly through a nearly vertical face to the postpetiolar junction. Major: in side view, occiput is relatively narrow, and the profile of the posterior half of the dorsal surface of the head just in front of it is straight or nearly so; scape shorter, 0.50–0.59× Head Width. Minor: occiput broader, with the nuchal collar very thin and barely discernible in full-face view (Cuba, Jamaica, Central America, Colombia, Venezuela)..... ***fallax***

Major and minor: in profile, petiolar node much less distinct, its summit running anteriorly to the peduncle through a shallow convexity and posteriorly through a shallow, oblique convexity to the postpetiolar junction. Major: in side view, occiput broader, with the profile of the posterior half of the dorsum of the head anterior to the occiput moderately convex; scape longer, its length 0.60–0.70× Head Width. Minor: occiput narrower, with the collar prominent in full-face view (extremely abundant, especially in disturbed environments, through the West Indies and South Americas as far south as northern Argentina)..... ***jelskii***

22(18) Large species (Head Width of major about 2.0 mm). Major: gena (surface of head laterad to eye) in side view entirely covered by carinulae all the way posteriorly to the occiput..... **23**

Small species (Head Width of major 1.3–1.7 mm). Major: most of gena in side view free of carinulae, instead either densely foveate and opaque or smooth and shiny..... **24**

23 Major and minor: mesopleuron covered by longitudinal carinulae. Major: in full-face view, scape reaching margin of head nearly halfway from level of eye to level of occipital border; propodeal spine in side view narrow, forming a triangle with sides longer than the base (Costa Rica)..... ***hirsuta***

Major and minor: mesopleuron lacking carinulae. Major: in full-face view, scape reaching margin of head only about one-fourth the distance from the level of eye to level of occipital border; propodeal spine in side view with sides only as long as the base (Brazil)..... ***gigas***

24(22) Major: pronotal dorsum covered by broken transverse carinulae, and mesopleuron by broken longitudinal carinulae. Minor: dorsal surface of head smooth and shiny; head narrowed posteriorly, with a nuchal collar posterior to the occiput (Amazonian Peru)..... ***tobini***

Major: pronotal dorsum not carinulate, but with a small patch of rugoreticulum on the humeri; mesopleuron lacking carinulae also. Minor: dorsal surface of head foveolate and opaque, and with scattered longitudinal carinulae; occiput broad, lacking nuchal collar (Arizona)..... ***perpilosa***

25(1) Major: antennal scapes approach the occipital corners to within 1.5× their own maximum width, reach the corners, or exceed them..... **26**

Major: antennal scapes fail to reach the occipital corners by 2× or more their own maximum width..... **62**

26 Major: antennal scapes exceed the occipital corners by 5× their own maximum width, or a distance equal to half the distance from the level of the posterior margin of the eye to the level of the occipital margin (southern California, northern Mexico)..... ***vistana***

Major: antennal scapes, if they exceed the occipital corner, do so by no more than 3X their own maximum width, or about one-fourth the distance from the level of the eye to the level of the occipital margin..... **27**

27 Major: either frontal lobes covered by rugoreticula or else multiple carinulae arising on the frontal lobes break up into strongly developed rugoreticula on the lobes or posteriorly to them, with multiple cross-carinulae **28**

Major: either carinulae (and rugoreticula) absent on frontal lobes or else if multiple carinulae arise there, they do not break up posteriorly into well-developed rugoreticula **36**

28 Major: frontal lobes covered mostly or entirely by rugoreticulum **29**

Major: frontal lobes covered mostly or entirely by carinulae or smooth areas, not by rugoreticulum **32**

29 Major: half or more of pronotal dorsum covered by rugoreticulum; median ocellus present (montane Tamaulipas, Mexico) (placed in the *punctatissima* group; also keyed out here to ensure identification; see also *inca* in *punctatissima* group) **30**

Major: pronotal dorsum lacking rugoreticulum; at most, its anterior half with a few broken carinulae or nonreticulate rugulae; ocelli absent **31**

30 Major: in full-face view, rugoreticulum extends past the level of the margin of the eye for a distance halfway to the level of the posteriormost occipital margin; head bicolored, with anterior one-fourth dark yellow and posterior three-fourths medium brown ..... ***nubicola***

Major: in full-face view, rugoreticulum extends past the level of the posterior margin of the eye for a distance only about equal to the length of the eye; entire head light to medium reddish brown ..... ***cielana***

31(29) Major: broken rugulae present on occiput in full-face view as well as on anterior third of pronotal dorsum. Minor: head and pronotum foveolate and opaque (montane Veracruz, Mexico) ..... ***roushae***

Major: rugulae absent on occiput and pronotal dorsum. Minor: head and pronotal dorsum smooth and shiny (Costa Rica) ..... ***indagatrix***

32(28) Major: vertex to mid-occiput, seen in full-face view, covered by loose, isolated patch of rugoreticulum, occipital lobes and space between vertex and central triangle smooth and shiny (Pará, Brazil) ..... ***aenescens***

Major: vertex and mid-occiput either lacking rugoreticulum or, if rugoreticulum is present, it is dense and solidly connected with surrounding, equally dense rugoreticula of dorsal head surface **33**

33 Major: scapes exceeding margins of occipital lobes by at least 2× their own width **34**

Major: scapes just reaching margins of occipital lobes **35**

34 Major: in full face view, no hairs break past the margin of the head except along the anterior margin of the clypeus; weak transverse carinulae present on pronotal dorsum. Minor: head drawn out posteriorly into a neck, followed by a nuchal collar more than half as long as the eye; head and pronotal dorsum smooth and shiny (Brazil, Peru) ..... ***cuevasi***

Major: in full-face view, a dense fringe of hairs project beyond the margin of the head everywhere except the inner margins of the occipital lobes; pronotal dorsum lacking carinulae. Minor: head narrowed somewhat at occiput but not into a neck, and nuchal collar is less than one-fourth as long as the eye; dorsal surfaces of head and pronotum foveolate and opaque (Morelos, Mexico) ..... ***skwarrae***

35(33) Major: in full-face view, rugoreticulum and carinulae covering all of dorsal surface of head except occipital lobes; in profile, posterior dorsal third of head capsule (just anterior to the occipital lobes) weakly concave; many hairs on dorsa of head and mesosoma 1.5× as long as length of eye, or longer; bicolored, with head reddish yellow and body medium brown (montane Venezuela) ..... ***rubiceps***

Major: in full-face view, rugoreticulum and carinulae extend posteriorly past level of eye only about as much as length of eye; in profile, posterior dorsal third of head capsule moderately convex; hairs on dorsa of head and mesosoma shorter than eye length; concolorous medium brown, with anterior rim of head capsule yellowish brown (central Mexico) (also, check *tijucana*) ..... ***tolteca***

36(27) Major: in full-face view, carinulae completely cover frontal lobes, and they do not travel straight back on leaving the lobes but fan out posteriorly to create a broad spreading array behind the lobes, with the carinulae from the outer edges of the array turning almost horizontally to reach the space just above the eye (montane Peru) ..... ***kugleri***

Major: carinulae either absent over most or all of the frontal lobes or, if they cover the lobe, travel straight back on leaving the lobes **37**

37 Major: in side view, propodeal spine more than a third as long as the basal face of the propodeum just anterior to it. Minor: propodeal spine as long as basal face of propodeum, or longer **38**

Major and minor: in side view, propodeal spine no more than one-fourth as long as the basal face of the propodeum just anterior to it, and in many species it is reduced to a denticle **39**

38 Major: mesopleuron covered by weak longitudinal carinulae; posterior half of dorsum of head foveolate and opaque; head bicolored, with genae anterior to eye yellow and rest of head medium brown (montane southern Costa Rica) ..... ***hector***

Major: mesopleuron lacking carinulae; posterior half of dorsum of head smooth and shiny; head concolorous light brown (Amazonian Brazil) ..... ***jaculifera***

39(37) Major: lower half of mesopleuron covered by parallel longitudinal carinulae **40**

Major: lower half of mesopleuron lacking carinulae or with at most 2–3 next to lower margin **41**

40 Major: rugoreticulum and carinulae mesad to eye reaching four-fifths the way from the eyes to the margins of the occipital lobes. Minor: mesopleuron lacking carinulae (Rio de Janeiro, Brazil) ..... ***tijucana***

Major: rugoreticulum and carinulae mesad to eye reaching only halfway from the eyes to the margins of the occipital lobes. Minor: lower two-thirds of mesopleuron covered by longitudinal carinulae (Chocó, Colombia) ..... ***chocoensis***

41(39) Major and minor: pilosity very sparse; seen from side, dorsal profile of mesosoma with fewer than 10 hairs in major and completely bare in minor (Rio de Janeiro, Brazil) (antennae of available specimen missing; keyed out here and later to cover both lugs of couplet 25) ..... ***punctithorax*** **(in part)**

Major and minor: pilosity dense, including that projecting above mesosomal profile **42**

42 Major: frontal lobes completely lacking carinulae **43**

Major: frontal lobes bearing at least 1 or 2 carinulae on each of the lobes that extend for at least part of the length of the lobes **47**

43 Major: in full-face view, carinulae mesad to the eyes extend posteriorly over three-fourths the distance from the level of the posterior margins of the eyes to the level of the occiput; scape just reaches occipital corner (Nayarit, Mexico) ..... ***hamtoni***

Major: in full-face view, carinulae mesad to the eyes reach at most one-third the distance from the level of the posterior margins of the eyes to the level of the occiput, scape just reaches occipital corner or exceeds it **44**

44 Major: scape just reaching occipital corner; transverse carinulae cover anterior third of pronotal dorsum. Major and minor: color dark yellow (Amazonian Brazil) ..... ***araneoides***

Major: scape exceeds occipital border by 1–2× its own greatest width; transverse carinulae present or absent on anterior third of pronotal dorsum. Major and minor: color yellow or brown **45**

45 Major: large (Head Width 1.7 mm), reddish yellow (Amazonian Brazil) ..... ***wallacei***

Major: smaller (Head Width 0.8–1.2 mm), brown **46**

46 Major: head narrowed at occiput, 1.1× longer than broad; rugoreticulum on head limited to a small patch just mesad and anterior to eye; pronotum completely bare of carinulae. Minor: pronotum completely smooth and shiny (Amazonian Peru) ..... ***leptina***

Major: head of typical *Pheidole* shape, almost as broad as long; rugoreticulum on head extensive between eye and antennal fossa; pronotum with broken carinulae on anterior third of dorsum. Minor: lateral edges of pronotal dorsum foveolate and opaque (southeastern Brazil) ..... ***wolfringi***

47(42) Major: head lacking any rugoreticulum (Arizona) ..... ***portalensis***

Major: at least some rugoreticulum present between eye and antennal fossa **48**

48 Major: surface of first 3 gastral tergites covered by very short, completely appressed hairs; in addition, anterior half of dorsum of first gastral tergite (upper surface of first gastral segment) viewed in profile lined with uniform, slightly longer subrecumbent hairs (most about the width of the propodeal spiracles), and gastral sternites (lower surface of gaster) also with uniform, suberect hairs half the length of the eye; this uniquely mixed gastral pilosity is in contrast to the longer, irregular pilosity on the rest of the body (Mexico, Nicaragua) ..... ***psilogaster***

Major: appressed hairs and other pilosity of gaster other than described above **49**

49 Major: in profile, first 2 gastral tergites covered by a dense, uniform pile of suberect hairs slightly shorter than the width of the propodeal spiracle; in addition, anterior half of first 2 gastral tergites bear "normal" suberect hairs of variable length (central and northeastern Mexico) ..... ***potosiana***

Major: pilosity of gaster other than described above **50**

50 Major: at least several parallel "wraparound" carinulae cover anterior fifth or more of the pronotal dorsum (seen from above) and continue curving down to cover the lower fifth or more of the sides of the pronotum (seen from the side) **51**

Major: pronotum lacking "wraparound" carinulae **54**

51 Major: rugoreticulum and carinulae immediately mesad to the eye extend posteriorly beyond the eye to halfway between level of the eye and level of the occipital border **52**

Major: rugoreticulum and carinulae immediately mesad to the eye extend posteriorly beyond the eye for a distance only about the length of the eye **53**

52 Major: parallel transverse carinulae, even though weak, cover all of dorsum of pronotum; a patch of the anterior strip of the median half of the first gastral tergite shagreened and opaque (Nicaragua to Venezuela) ..... ***kukrana***

Major: center of pronotal dorsum lacking carinulae; first gastral tergite entirely smooth and shiny (West Indies, Central and South America) ..... ***obscurior***

53(51) Major: pronotal dorsum and dorsa of petiolar and postpetiolar nodes foveolate and opaque. Minor: pronotum foveolate and opaque; some of the hairs on pronotal dorsum longer than the eye (southeastern Brazil) ..... ***nesiota***

Major: pronotal dorsum and dorsa of petiolar and postpetiolar nodes smooth and shiny. Minor: pronotal dorsum smooth and shiny; hairs on pronotal dorsum shorter than length of eye (southwestern Texas) ..... ***sitiens***

54(50) Minor: occiput with nuchal collar **55**

Minor: occiput lacking nuchal collar, even when occiput is strongly narrowed **58**

55 Major: pronotal dorsum foveolate and opaque; median half of first 3 gastral tergites entirely shagreened and opaque (Morelos, Mexico) ..... ***petrensis***

Major: pronotal dorsum mostly smooth and shiny; shagreening on gaster limited to small patch on first tergite just behind the postpetiolar junction **56**

56 Major: carinulae just mesad to eye extending beyond eye for a distance halfway to the level of the occipital border (Argentina) ..... ***durionei***

Major: carinulae just mesad to the eye extending beyond the eye for a distance only about as great as the length of the eye **57**

57 Major: antennal scape just reaching margin of occipital corner; pronotal profile with two shallow but distinct convexities; dorsal profile of petiolar peduncle with standing hairs (Amazonian Peru) ..... ***lupus***

Major: antennal scape surpassing margin of occipital corner by about its own maximum width; pronotal profile a single, smoothly continuous convexity; hairs absent from dorsum of petiolar peduncle (Bolivia, Ecuador) ..... ***haskinsorum***

58(54) Major: frontal lobe area completely covered by parallel longitudinal carinulae, up to and including those arising from the posterior border of the frontal triangle to travel along the dorsal midline of the head. Minor: in side view, propodeal spine reduced to an obtuse angle formed by the basal and declivitous faces of the propodeum (vic. Mexico City) (placed in the *pilifera* group; also keyed out here to ensure identification) ..... ***azteca***

Major: a large space between the frontal lobes, posterior to and at the very least as wide as the frontal triangle, devoid of carinulae. Minor: in side view, the propodeal spine is well developed, at the very least as a sharp denticle projecting up from the juncture of the basal and declivitous faces of the propodeum **59**

59 Major: rugoreticulum of dorsum of head extends to fill space between eye and the anterior genal border; sides of pronotum foveolate and opaque (southwestern U. S., California, northern Mexico) (check against *cockerelli*) ..... ***hyatti***

Major: rugoreticulum of head limited to space between eyes and frontal lobes, not extending to area anterior to the eyes **60**

60 Major: postpetiolar node seen from above oval, its lateral margins not subangular; dorsal profile of petiolar node (viewed from rear) strongly convex; pronotal profile, in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view) smoothly rounded, as an arc of a circle. Major and minor: yellow (Panama, northern and central South America) ..... ***midas***

Major: postpetiolar node in dorsal-oblique view with subangular lateral margins; dorsal profile of petiolar node (viewed from rear) flat or slightly concave; pronotal profile, seen from above and obliquely, subangulate. Major and minor: yellow or brown **61**

61 Major: almost all of the dorsal surface of the head between the frontal lobes and occipital lobes foveolate and opaque; carinulae absent from pronotum. Minor: in full-face view, head strongly constricted behind, yet the occipital border is concave and nuchal collar is absent. Major and minor: yellow (southwestern U. S.) ..... ***desertorum***

Major: all of the space between the frontal lobes and occiput smooth and shiny; transverse carinulae present on anterior fifth of pronotum. Minor: head not narrowed; occiput broad and convex. Major and minor: brown (eastern Mexico) (placed in the *crassicornis* group; also keyed out here to ensure identification)..... ***fariasana***

62(25) Major: antennal scape much wider near its insertion than anywhere along its distal half..... **63**

Major: antennal scape along its distal half as wide as or wider than near its insertion..... **64**

63 Major: parallel longitudinal carinulae occur all across the frontal lobes and posterior to them, as well as anterior half of the pronotal dorsum (Brazil, Bolivia)..... ***claviscapa***

Major: most of frontal lobes and region posterior to them, as well as on anterior half of the pronotal dorsum, are rugoreticulate (Mato Grosso, Brazil) ..... ***valens* (in part)**

64(62) Major: rugulae originating near the posterior outer margins of the frontal lobes travel laterally or obliquely to the lateral margins of the head above the eyes **65**

Major: any rugulae or carinulae that originate near the posterior outer margins of the frontal lobes travel more or less straight back and not to the sides of the head..... **66**

65 Major: rugulae departing from the posterior outer margins of the outer margins of the frontal lobes travel laterally to the eyes; dorsal surface of the head directly posterior to the frontal triangle lack rugulae or carinulae. Major and minor: propodeal spine reduced to a denticle (Colombia) ..... ***oliveirai***

Major: rugulae departing from the posterior outer margins of the frontal lobes travel obliquely upward to the sides of the head above the eyes; dorsal surface of the head posterior to the frontal triangle bears rugulae that extend most or all the way to the occiput. Major and minor: propodeal spine well developed, in side view about one-fourth as long as the basal face anterior to it (Peru) ..... ***huacana***

66(64) Major: no rugoreticulum on head, only parallel longitudinal carinulae **67**

Major: rugoreticulum present between eye and antennal fossa and often elsewhere on head..... **71**

67 Major: medium-sized (Head Width about 1.0–1.3 mm); propodeal spine reduced to denticle or, if present, forms a 135-degree angle with the basal face of the propodeum in side view (U. S., northern Mexico) **68**

Major: large to very large (Head Width 1.9–2.5 mm); propodeal spine strongly developed and projects perpendicularly up from the basal face of the propodeum in side view (South America) **69**

68 Major: propodeal spine reduced to a barely perceptible denticle whose apex forms a right angle; most of frontal lobes smooth. Minor: posterior half of dorsal head surface smooth (New York to Florida, west to Texas) ..... ***morrisi***

Major: propodeal spine strongly developed, about one-third as long as basal surface of propodeum anterior to it; frontal lobes covered by carinulae. Minor: posterior half of dorsal head surface foveolate and opaque (central Texas to California and Chihuahua) ..... ***sciophila***

69 Major: carinulae cover most of the genae posterior to the eye, as well as anterior and lateral margins of the pronotum and all of the sides of the propodeum (Colombia, Ecuador) ..... ***praeusta***

Major: carinulae do not extend posteriorly beyond the eye for a distance greater than the length of the eye; carinulae absent from all but the posterior lower quarter of the side of the propodeum (Brazil) **70**

70 Major: postpetiole seen from above ellipsoidal with subangulate margins; humerus in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view) 2-lobed; anterior fourth of pronotum transversely carinulate. Minor: reddish brown (Argentina, Paraguay, southern and central Brazil) (placed in the *diligens* group; also keyed out here to ensure identification) ..... ***oxyops***

Major: postpetiole seen from above trapezoidal; humerus in dorsal-oblique view single-lobed and subangulate; pronotum entirely smooth, not carinulate. Minor: pronotum foveolate. Major and minor: yellow (Mato Grosso, Brazil) ..... ***trageri***

71(66) Major: entire dorsal profile of body (head, mesosoma, waist, and gaster) covered by uniformly dense, almost perfectly erect, bristle-like hairs, which are about the length of the eye. Relatively large species (Head Width of major 1.7–2.3 mm) **72**

Major: pilosity not uniformly erect over entire body dorsum nor of nearly uniform length on each body part in turn; size variable **73**

72 Major: seen in full-face view, all of dorsal surface of head between eyes and frontal lobes, except for occipital lobes, covered by parallel longitudinal carinulae; pronotal dorsum smooth and shiny; very large (Head Width 2.2–2.3 mm), reddish yellow (Guianas to Peru) ..... ***astur***

Major: seen in full-face view, parallel longitudinal carinulae between eyes and frontal lobes extend only halfway from level of posterior margins of the eyes to the level of the occipital lobes; anterior fourth of pronotal dorsum bearing parallel transverse carinulae, or else its entire surface foveolate and opaque; small (Head Width 1.7–2.0 mm) (Mexico, Costa Rica) ..... ***gouldi***

73(71) Major: in side view, posterior half of dorsal profile of head, including profile of occiput, covered by a very dense layer of oblique, forward-directed hairs (making an angle of about 45 degrees with the surface), and of uniform length (less than the length of the eye), the whole forming a felt-like layer strikingly different from the pilosity on the rest of the body **74**

Major: lacking a dense, specialized layer of hairs on the dorsal profile of the head as described above **77**

74 Major: rugoreticulum a loose network, its cells half as long as the eye or longer and smooth and shiny; propodeal spine short, its apex forming a right angle. Minor: propodeal spine absent, the juncture of the basal and declivitous propodeal faces seen in side view a smooth, convex curve (Amazonian Brazil)..... ***paraensis***

Major: rugoreticulum tight and dense, its cells less than half as long as the eye and opaque; propodeal spine well developed, its apex forming an acute angle. Minor: propodeal spine well developed, at least as a denticle..... **75**

75 Major: rugoreticulum on dorsal surface of head extending posteriorly to three-fourths the distance from the eye to the occipital corner; lower anterior half of mesopleuron bearing parallel longitudinal carinulae (Venezuela)..... ***lattkei***

Major: rugoreticulum on dorsal surface of head extending less than one-fourth the distance from the eye to the occipital corner; lower anterior half of mesopleuron lacking carinulae **76**

76 Major: carinulae around the dorsal midline of the head reach the occipital border; anterior fourth of pronotum covered by parallel carinulae; in side view, slope of petiole from summit of node to junction with propodeum is strongly concave; reddish brown (Amazonian Brazil and Peru)..... ***cursor***

Major: carinulae around the dorsal midline of the head fail to reach the occiput; anterior fourth of pronotum with at most a faint trace of carinulae; in side view, slope of petiole from summit of node to junction with propodeum is straight; brownish yellow (Venezuela to Peru) ..... ***laniger***

77(73) Major: mesopleuron carinulate or rugulate..... **78**

Major: mesopleuron lacking carinulae or rugulae..... **82**

78 Major: in side view, propodeal spine half as long as the basal face anterior to it; pronotal dorsum with scattered rugulae, the intervening surface foveolate and opaque (Costa Rica)..... ***lourothi***

Major: in side view, propodeal spine one-fourth as long as the basal face anterior to it, or less; pronotal dorsum carinulate or bare, mostly lacking foveolae, its surface shiny..... **79**

79 Major: in full-face view, head capsule rectangular in outline; anterior three-fourths of median half of first gastral tergite shagreened and opaque. Minor: in full-face view, occiput narrowed strongly to create a neck, followed by a nuchal collar (Argentina and Minas Gerais, Brazil) ..... ***jujuyensis***

Major: in full-face view, head capsule roughly heart-shaped in outline; at most, anterior half of median half of first gastral tergite shagreened and opaque. Minor: occiput narrowed but not forming a distinct neck, and nuchal collar either present or not..... **80**

80 Major: carinulae running along dorsal midline of head extend posteriorly all the way to the occipital border; antennal scape reaching only one-fourth the distance from the level of the eye to the margin of the occipital corner. Minor: nuchal collar absent (Colombia) (placed in the *tristis* group; also keyed out here to ensure identification) ..... ***steinheili***

Major: carinulae running along dorsal midline of head fail to reach occipital border by a distance at least 3× the length of the eye; antennal scape reaching at least one-half the distance from the level of the eye to the margin of the occipital corner. Minor: nuchal collar present..... **81**

81 Major: sides of propodeum anterior to spiracle covered by parallel transverse carinulae; occipital lobes sprinkled with conspicuous foveae; in side view, apex of petiolar node acute; body light reddish yellow. Minor: propodeal spine strongly developed, one-fourth as long as the basal propodeal face anterior to it (Amazonian Peru) ..... ***galba***

Major: sides of propodeum anterior to spiracle lacking carinulae; occipital lobes lack conspicuous foveae; in side view, apex of petiolar node square; body brown. Minor: propodeal spine reduced to denticle a tenth the length of the basal propodeal face, or less (Amazonian Brazil) ..... ***lovejoyi***

82(77) Major: anterior third of pronotal dorsum rugoreticulate **83**

Major: anterior third of pronotal dorsum smooth, transversely carinulate, or transversely rugulose, but not reticulate **85**

83 Major: in side view, profile of first gastral tergite fringed by a dense row of short, oblique hairs of uniform length about one-fourth as long as the eye. Minor: in full-face view, lacking a nuchal collar. Major and minor: body yellow (Nicaragua) ..... ***acamata***

Major: in side view, profile of first gastral tergite fringed by erect to suberect hairs, many or most of which are more than half as long as the eye or longer. Minor: in full-face view, a nuchal collar is visible. Major and minor: body reddish brown **84**

84 Major: basal face of propodeum covered by prominent, parallel transverse carinulae; in side view, propodeal spine nearly one-half as long as the basal face of the propodeum anterior to it; gastral hairs very dense and longer than the eye (Mato Grosso, Brazil) ..... ***valens*** **(in part)**

Major: basal face of propodeum lacks transverse carinulae; in side view, propodeal spine only one-tenth as long as basal face of propodeum anterior to it; gastral hairs very sparse and somewhat shorter than the eye (Rio de Janeiro, Brazil) (antennae of available specimen missing; keyed out here and previously to cover both lugs in couplet 25) ..... ***punctithorax*** **(in part)**

85(82) Major: seen in full face, profile of the entire margin of the head other than the anterior clypeal border lacks hairs or at most has 2 or 3 hairs extending past the margin **86**

Major: seen in full face, profile of the entire margin of the head other than the anterior clypeal border with at least 6 hairs extending beyond the margin **89**

86 Major: rugoreticulum mesad to the eyes extends three-fourths the distance from the posterior borders of the eyes to the level of the margins of the occipital lobes; in side view, the mesonotal convexity is extremely prominent, as high as it is broad at the base (Costa Rica) (placed in the *diligens* group; also keyed out here to ensure identification) ..... ***texticeps***

Major: rugoreticulum mesad to the eyes not extending posteriorly beyond the posterior borders of the eyes; in side view, the mesonotal convexity is prominent but only about half as high as it is wide at the base **87**

87 Major: in full-face view, posterior half of dorsum of head capsule smooth and shiny. Minor: posterior half of dorsum of head capsule and all of pronotum smooth and shiny (Guatemala) ..... ***maja***

Major: in full-face view, posterior half of dorsum of head capsule completely foveolate and opaque. Minor: posterior half of dorsum of head and all of pronotum completely foveolate and opaque **88**

88 Major: in side view, profile of posterior third of head weakly concave; dorsal surface of occipital lobes covered by sparse, completely appressed short yellow hairs; central half of first gastral tergite shagreened and opaque. Minor: occiput with nuchal collar (Amazonian Peru) (placed in the *biconstricta* group; also keyed out here to ensure identification) ..... ***fissiceps***

Major: in side view, profile of posterior third of dorsum of head moderately convex; dorsal surface of occipital lobes lacking appressed yellow hairs; first gastral tergite entirely smooth and shiny. Minor: occiput lacking nuchal collar (Morelos, Mexico) ..... ***optiva***

89(85) Major: anterior third of first gastral tergite covered by parallel longitudinal fine striae; mesonotal dorsum transversely carinulate (northeastern Brazil) ..... ***impressa***

Major: first gastral tergite lacking longitudinal striae; mesonotal dorsum transversely carinulate or not **90**

90 Major: profile of humerus in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view) is subangulate, forming an obtuse angle with or without a denticle (see drawings of species that follow in order to clarify distinction) **91**

Major: profile of humerus seen in dorsal-oblique view, smoothly rounded convexity **95**

91 Major: sides of pronotum covered by curving, "wraparound" carinulae (Brazil, Argentina) ..... ***puttemansi***

Major: sides of pronotum lacking carinulae **92**

92 Major: longitudinal carinulae on dorsal surface of head extending posteriorly beyond eyes to less than halfway between level of the posterior margin of the eye and level of the occipital lobes **93**

Major: longitudinal carinulae on dorsal surface of head extending posteriorly beyond eyes to three-fourths or more the distance from eye to occiput **94**

93 Major: head bicolorous, with brownish yellow anterior third and reddish brown posterior two-thirds; sides of pronotum entirely smooth and shiny (Argentina) ..... ***pampana***

Major: head concolorous reddish brown; sides of pronotum foveolate and partially opaque (montane Nayarit, Mexico) ..... ***tetroides***

94(92) Major: rugoreticulum mesad to the eye extends posteriorly beyond the eye for a distance twice the length of the eye; dorsal face of the propodeum transversely carinulate; transverse carinulae on pronotal dorsum limited to its anterior third, and the surface of the dorsum otherwise smooth and shiny. Minor: seen from above and obliquely, humerus surmounted by a denticle; head smooth and shiny (Argentina) ..... ***humeridens***

Major: rugoreticulum mesad to the eye does not extend posteriorly beyond the eye; dorsal surface of the propodeum lacks carinulae; transverse carinulae cover the pronotal dorsum, which is also entirely foveolate and opaque. Minor: seen from above and obliquely, profile of humerus a smoothly convex curve lacking a denticle (Texas, New Mexico) ..... ***sciara***

95(90) Major: rugoreticulum mesad to the eye extends posteriorly beyond level of posterior margin of eye for a distance 3× or more greater than the length of the eye **96**

Major: rugoreticulum mesad to the eye not extending posteriorly beyond level of posterior margin of eye at most by a distance greater than the Eye Length **97**

96 Major: propodeum both above and anterior to spiracle covered by carinulae; mesopleuron smooth and shiny (Uruguay) ..... ***industa***

Major: propodeum both above and anterior to spiracle lacking carinulae; mesopleuron foveolate and opaque (Mexico to northern South America, Puerto Rico) ..... ***susannae***

97(95) Major: carinulae mesad to the eye break up into a field of irregular rugulae and rugoreticulum posterior to level of the eye (Costa Rica) (placed in the *diligens* group; also keyed out here to ensure identification) ..... ***prostrata***

Major: carinulae mesad to the eye do not break up posteriorly into rugulae and rugoreticulum **98**

98 Major: entire dorsal surface of head, including area posterior to the field of carinulae and rugoreticulum, densely foveolate and opaque **99**

Major: dorsal surface of head posterior to field of carinulae and rugoreticulum at most with widely scattered foveolae, and largely smooth and shiny **100**

99 Major: carinulae originating on frontal lobes extend past the level of the posterior margin of the eye only by a distance of 2× the length of the eye; seen from the side, propodeal spine long and very thin, its base only slightly wider than its shaft halfway to the tip; propodeal spiracle very large, 2× as wide as the base of the propodeal spine. Minor: posterior half of dorsum of head smooth and shiny, and nuchal collar present (Panama) ..... ***aculifera***

Major: carinulae originating on frontal lobes extend past the level of the posterior margin of the eye by a distance of 4× or more the length of the eye; seen from the side, propodeal spine short and robust, nearly equitriangular, its base more than 2× wider than the width of the shaft halfway to the tip; propodeal spiracle narrower than the propodeal spine measured at the base. Minor: posterior half of dorsum of head foveolate and opaque; occiput lacks nuchal collar (montane Chiapas, Mexico) ..... ***chiapasana***

100(98) Major: anterior third of pronotal dorsum covered by parallel transverse carinulae **101**

Major: pronotal dorsum lacks parallel transverse carinulae **105**

101 Major: propodeal spine reduced to a denticle shaped like an equilateral triangle (Chihuahua, Mexico) ..... ***madrensis***

Major: propodeal spine well developed, its shaft longer than its width at the base **102**

102 Major: dorsum and sides of propodeum lacking carinulae (Rio de Janeiro, Brazil) ..... ***alienata***

Major: dorsum and/or sides of propodeum covered by carinulae **103**

103 Major: the strip of head dorsum posterior to the frontal triangle lacking carinulae, smooth and shiny; humerus, in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view), subangulate (southeastern Brazil, Argentina) (placed in the *diligens* group; also keyed out here to ensure identification) ..... ***laevinota***

Major: the strip of head dorsum posterior to the frontal triangle covered by carinulae all the way mesad to the midline of the head; humerus, in dorsal-oblique view, smoothly rounded **104**

104 Major: carinulae posterior to the frontal triangle reach more than halfway from the level of the posterior margins of the eyes to the level of the margins of the occipital lobes; profile of pronotal dorsum, seen in dorsal-oblique view, consists of 2 convexities (thus the promesonotum has 3 convexities, all about the same size and shape). Minor: posterior half of dorsum of head foveolate and opaque; occipital border concave, not narrowed, and lacking nuchal collar (central Mexico) ..... ***laevivertex***

Major: carinulae posterior to frontal triangle reach only one-third the distance from the level of the posterior margins of the eyes to the level of the occipital lobes; profile of pronotal dorsum, seen in dorsal-oblique view, consists of only a single convexity (thus the promesonotum has 2 convexities, with the pronotal convexity much larger than the mesonotal convexity). Minor: posterior half of dorsum of head smooth and shiny; occiput strongly narrowed, with nuchal collar (Argentina, Uruguay) ..... ***bergi***

105(100) Major: in full-face view, carinulae cover all of the posterior half of the dorsum of the head except for occipital lobes (Guatemala) (placed in the *tristis* group; also keyed out here to ensure identification) ..... ***deceptrix***

Major: in full-face view, carinulae extend posteriorly at most only slightly past the mid-level of head capsule **106**

106 Major: propodeal spine perfectly vertical to and half as long as the basal face of the propodeum anterior to it; head and body light brownish yellow, with a vaguely defined circular brown spot just above the center of the dorsum of the head. Minor: occiput narrow, with nuchal collar (southern Mexico to Panama) ..... ***dossena***

Major: in side view, propodeal spine only a third as long as the basal face of the propodeum anterior to it, and often tilted backward to form an angle of about 135 degrees with the basal face; head and body concolorous plain or reddish brown, with no contrasting spot on the center of the dorsum of the head. Minor: occiput broad, with no nuchal collar **107**

107 Major: in full-face view, entire head margin (exclusive of anterior clypeal margin) lined with no more than a dozen or so hairs (Argentina, southern Brazil) (note: also consult drawing of *eidmanni,* which keys out here and may be a junior synonym of *nitidula* but is kept as a species provisionally because of small differences in the lectotype in carinulae of the frontal lobes, profile of head in full-face view, and promesonotum seen from above and obliquely) ..... ***nitidula***

Major: in full-face view, entire head margin lined with dense pilosity **108**

108 Major and minor: in side view, propodeal spine is well developed, the shaft longer than the base is broad. Major: in full-face view, head subrectangular (southeastern U. S. to Texas and northern Mexico) ..... ***dentata***

Major and minor: in side view, propodeal spine is only a denticle, which forms an equilateral triangle. Major: in full-face view, outline of head is heart-shaped (Argentina) **109**

109 Major: side of propodeum anterior to spiracle vertically carinulate. Minor: side of propodeum anterior to spiracle transversely rugulose; occiput in full-face view flat. Major and minor: gaster light to medium brown, rest of body yellow ..... ***cordiceps***

Major and minor: side of propodeum anterior to spiracle foveolate only, not carinulate or rugulose; body overall light brown ..... ***dione***

The *flavens* Group

These species, the great majority of which are instantly recognizable by their small size, vestigial or absent mesonotal convexity, and short, 12-segmented antennae, compose the most speciose and numerically abundant group of the New World *Pheidole*. Found variously from North Carolina to Argentina, the species collectively are also, with the *fallax* group, the most widely distributed of the *Pheidole* groups. One species, *darlingtoni,* is known only from the minor worker and is not included in the key that follows. An apparent endemic of Haiti, it is readily distinguished by its rugoreticulate clypeus and strikingly bicolorous head (whitish yellow and light brown).

1 Major: seen in full-face view, rugoreticulum present on occiput, or at least the occipital lobes, or in bands or patches directly in front of the occipital lobes, or elsewhere on the posterior fifth of the dorsal surface of the head **2**

Major: seen in full-face view, no rugoreticulum present on or near the occiput or anywhere on the posterior fifth of the dorsal surface of the head **30**

2 Major: in full-face view, entire occiput, including the occipital lobes and the dorsal surface of the head between them, is covered by rugoreticulum **3**

Major: in full-face view, at least a posteriormost strip of the occiput, or at least a narrow space along the occiput at the midline, or both, is free of rugoreticulum **18**

3 Major: in full-face view, all of the head behind the level of the posterior margin of the eyes rugoreticulate **4**

Major: in full-face view, a substantial space posterior to the eyes or to the frontal lobes, or to both, carinulate but not rugoreticulate **5**

4 Major: in side view, space immediately laterad to eye is rugoreticulate. Minor: posterior half of head rugoreticulate (Costa Rica, Honduras) ..... ***verricula***

Major: in side view, space immediately laterad to eye is carinulate, not rugoreticulate. Minor: posterior half of head foveolate, not rugoreticulate (Argentina, Uruguay) ***obtusopilosa***

5(3) Major: anterior third of pronotal dorsum entirely rugoreticulate; mesonotum longitudinally carinulate (Costa Rica) ..... ***renae***

Major: with possible exception of edges of humeri, anterior third of pronotal dorsum variously transversely carinulate, foveolate or smooth, but not rugoreticulate; mesonotum foveolate or smooth, not carinulate **6**

6 Major: pronotal dorsum, with the possible exception of the edges of the humeri, entirely smooth and shiny, and lacking carinulae **7**

Major: pronotal dorsum at least partly foveolate, and opaque to feebly shiny, often with transverse carinulae in addition **8**

7 Major: seen from above, the pronotal humeri form obtuse angles, with several short rugulae on the apices; in full-face view, the rugoreticulum covers the occipital lobes, but just barely extends to the midline of the head capsule, as well as along the sides of the head (Bolivia) ..... ***infernalis***

Major: seen from above, the pronotal humeri are evenly rounded, with no sculpturing of any kind on the apices; in full-face view, the rugoreticulum covers the entire posterior fourth of the head capsule (Honduras) ..... ***ceibana***

8(6) Major: pronotal dorsum entirely covered by (sometimes faint) transverse carinulae **9**

Major: carinulae absent from pronotal dorsum or at most limited to its anterior or lateral margins **10**

9 Major: seen in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view), profile of pronotal humerus forms a blunt obtuse angle; in side view posterior ventral quarter of head capsule is smooth and shiny. Minor: seen from above and obliquely, humeri bear acute-angular spines, each with a long hair emerging from its apex (Honduras) ..... ***floricola***

Major: seen in dorsal-oblique view, profile of humerus is smoothly rounded, in side view posterior ventral quarter of head capsule varies from foveolate and opaque to somewhat shiny. Minor: seen from above and obliquely, humerus bears low, inconspicuous convexities, which lack apical hairs (southern Brazil, Argentina, Paraguay) ..... ***lignicola***

10(8) Major: length of eye as great as the distance between the anterior margin of the eye to the front margin of the head capsule directly anterior to it **11**

Major: length of eye much less than the distance between the anterior margin of the eye and front margin of the head **12**

11 Major: seen in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view), pronotal humerus forms a right angle; body concolorous brown (Veracruz, Mexico) ..... ***xyston***

Major: seen in dorsal-oblique view, humerus a smoothly rounded convexity; body color yellow, except for light brown posterior bands on the gastral tergites and a fuzzy-edged brown spot on the vertex (Chocó, Colombia) ..... ***lemnisca***

12(10) Major: space between eye and antennal fossa lacks any rugulae or rugoreticulum, and is instead covered by longitudinal and circular carinulae **13**

Major: at least some of the space between the eye and antennal fossa occupied by rugoreticulum and/or rugulae **14**

13 Major: in side view, posterior rear half of head smooth and shiny; lateral margins of postpetiolar node seen from above acute-angular (Veracruz, Mexico) ..... ***prolixa***

Major: in side view, posterior rear half of head foveolate and opaque; lateral margins of postpetiolar node seen from above rounded (Costa Rica, Panama) ..... ***ruida***

14(12) Major: rugoreticulum confined to the occiput and space between eye and antennal fossa **15**

Major: rugoreticulum extends continuously from occiput down the side of the head all or almost all the way to the eye **16**

15 Major: antennal scrobes present, although shallow; longitudinal carinulae on the antennal lobes extend posteriorly all the way back to meet the rugoreticulum of the occiput (southern Brazil, Peru, Argentina)..... ***sospes***

Major: antennal lobes absent; longitudinal carinulae of frontal lobes confined to them, leaving almost all of the middle half of the dorsal surface of the head free of carinulae (Costa Rica)..... ***otisi***

16(14) Major: antennal scrobes present; pronotal humeri with small patches of rugoreticulum (southeastern Brazil)..... ***termitobia***

Major: antennal scrobes absent; pronotal humeri lacking rugoreticulum, being foveolate only..... **17**

17 Major: inner pair of hypostomal teeth reduced to denticles, much smaller than outer pair. Minor: posterior dorsal half of head lacks carinulae; body blackish brown with metallescent blue reflections (Florida to Texas)..... ***metallescens***

Major: inner pair of hypostomal teeth strongly developed, as long as outer pair. Minor: longitudinal carinulae cover the posterior dorsal half of the head; head and mesosoma light reddish brown, and waist and gaster dark yellow, with no metallescent reflections anywhere (southeastern United States, Texas)..... ***dentigula***

18(2) Major: in full-face view, rugoreticula near the lateral margins of the dorsal surface of the head extend continuously all the way from the occiput or close to it anteriorly to the level of the eyes..... **19**

Major: in full-face view rugoreticula at or near the occiput are limited to the occipital lobes, or to the nearby space just posterior to the antennal scrobes, or both, but do not also extend along the sides of the head anteriorly all the way to the level of the eyes..... **23**

19 Major: pronotal dorsum covered by transverse carinulae. Minor: posterior half of dorsal head surface and all of promesonotal dorsum covered by rugoreticulum (Costa Rica, southern Mexico)..... ***rectitrudis***

Major: pronotal dorsum lacking carinulae. Minor: no rugoreticulum present on promesonotal dorsum..... **20**

20 Major: antennal scrobes present, and their surface conspicuously lacks carinulae or rugulae, causing it to contrast with the heavily rugoreticulate surface all around the scrobes (Pará, Brazil)..... ***peltastes***

Major: antennal scrobes absent; behind and mesad to the frontal lobes, where scrobes occur in many other species, the surface is covered by carinulae, rugulae, or rugoreticulum..... **21**

21 Major: in full-face view, central half of the posterior dorsum of the head all the way to the occiput free of carinulae or rugulae (Nicaragua)..... ***rectisentis***

Major: in full-face view, central half of the posterior dorsum of the head covered by longitudinal carinulae or broken, irregular rugulae..... **22**

22 Major: carinulae originating on frontal lobes continue posteriorly all the way to the occipital border. Minor: body reddish yellow (Honduras, Belize)..... ***harrisonfordi***

Major: carinulae originating on frontal lobes break up into irregular, fragmented rugulae before reaching the occipital border, and in full-face view leave a thin strip of the occiput anterior to the border smooth (montane Ecuador)..... ***camilla***

23(18) Major: in full-face view, the frontal lobes, most of the space between the eyes and antennal fossae, as well as the occipital lobes, rugoreticulate, but most of the large space between the level of the eyes and the level of the occipital lobes is devoid of rugoreticulum, rugulae, or carinulae (montane Veracruz, Mexico) (placed in the *fallax* group; also keyed out here to ensure identification)..... ***roushae***

Major: in full-face view, the longitudinal carinulae extend posteriorly either to the occipital border or to the rugoreticulum just anterior to the border..... **24**

24 Major: in full-face view, most or all of the longitudinal carinulae or rugulae originating on the frontal lobes continue unbroken all the way to the occipital border or just anterior to it..... **25**

Major: in full-face view, the longitudinal carinulae or rugulae originating on the frontal lobes are interrupted by rugoreticulum before they reach the occipital border..... **28**

25 Major: rugoreticulum extends from the point reached by the tips of the antennal scapes all the way to the outer margins of the occipital lobes; pronotal dorsum covered by transverse carinulae. Minor: anterior half of pronotal dorsum rugoreticulate (Brazil and Misiones, Argentina) (consider also *bucolica,* placed in provisional synonymy under *rudigenis,* but a possible distinct species; see *rudigenis* Diagnosis)..... ***rudigenis***

Major: rugoreticulum limited to a patch just posterior to the point reached by the tip of the antennal scapes, and does not reach the outer margins of the occipital lobes. Minor: pronotal dorsum lacks rugoreticulum..... **26**

26 Major: shallow antennal scrobes present, the surface of their posterior half foveolate but free of carinulae, rugulae, or rugoreticulum; body medium brown. Major and minor: pronotum completely foveolate and opaque (Colombia)..... ***tayrona***

Major: antennal scrobe absent and space laterad to posterior part of the frontal lobes filled in with longitudinal carinulae; body yellow or reddish brown. Major and minor: pronotum foveolate or smooth and shiny..... **27**

27 Major: rugoreticulum present between eye and antennal fossa; body concolorous yellow. Major and minor: pronotum entirely foveolate and opaque (reticulate-headed form of the species, which also varies through intermediates to a form lacking rugoreticulum on the head; see also couplet 131) (widespread and abundant through the American tropics and, possibly as an adventive, also occurs in Florida; often carried accidentally by commerce)..... ***flavens* (in part)**

Major: rugoreticulum not present between eye and antennal fossa; body reddish brown, with head anterior to the eyes medium yellow, and tibiae and tarsi contrasting pale yellow (southern Mexico)..... ***albipes***

28(24) Major: longitudinal carinulae arising from the space between the eye and frontal lobe do not extend posteriorly beyond the level of the eye; head elongate (Head Length more than 1.2× Head Width). Minor: dorsa of head and pronotum foveolate and opaque (Costa Rica)..... ***longinoi***

Major: at least some of the longitudinal carinulae arising between the eye and frontal lobe extend posteriorly all the way to the rugoreticulum located on or near the occiput; head not elongate (Head Length less than 1.1× Head Width). Minor: dorsa of head and pronotum foveolate and opaque or smooth and shiny..... **29**

29 Major: in full-face view, rugoreticulum covers all of the occiput except the center, but extends anteriorly only to within 2× length of eye of the posterior margin of the antennal scrobes; humeral corners not rugoreticulate. Minor: dorsa of head and pronotum foveolate and opaque (Amazonian Peru) ..... ***ademonia***

Major: in full-face view, rugoreticulum approaches occiput only to within an eye length, leaving the remaining strip in front of the occipital border smooth and shiny; humeral corner rugoreticulate. Minor: dorsa of head and pronotum smooth and shiny (montane Dominica, West Indies) ..... ***perkinsi***

30(1) Major: in full-face view, head rectangular and very elongate (Head Length 1.6× longer than Head Width); dorsal head surface often lacking carinulae or rugulae of any kind (Costa Rica to Colombia) ..... ***christopherseni***

Major: in full-face view, head variable in shape among species (Head Length never as much as 1.5× longer than Head Width); carinulae always present and usually abundant, at least in concentric circles around the antennal fossae **31**

31 Major: rugoreticulum present somewhere on dorsal head surface, even if only as patches between the eyes and antennal fossae or as cross-hatching on the frontal lobes **32**

Major: rugoreticulum completely absent from the dorsal surface of the head **66**

32 Major: in full-face view, entire posterior half of the dorsal surface of the head is covered by longitudinal carinulae or rugulae, or carinulae plus patches of rugoreticulum, with the possible exception of the occiput and surface of the antennal scrobes **33**

Major: large portions of the posterior half of the dorsum of the head, such as most of the sides of the head, not just the occiput and antennal scrobes, are free of carinulae, rugulae, and rugoreticulum **49**

33 Major: in full-face view, carinulae or rugulae on the dorsal head surface extend posteriorly all the way to the occipital border **34**

Major: in full-face view, carinulae or rugulae on the dorsal head surface do not extend all the way to the occipital border; all or at least part of the occipital lobes lack them **39**

34 Major: prominent humeral "sharkfin" horns present on pronotum, projecting beyond the lateral margins of the rest of the pronotum even when viewed from directly above, their apices forming acute angles (Amazonian Peru) ..... ***gilva***

Major: humeral horns absent; humeral margins form evenly rounded convexities with no prominent protrusions **35**

35 Major: anterior third of pronotum lacking carinulae and rugoreticulum **36**

Major: anterior third of pronotum covered by transverse carinulae and patches of rugoreticulum **37**

36 Major: head broader than long; in full-face view, it expands posteriorly to reach maximum width at the occiput; conspicuously bicolored, with mesosoma, waist, and part of head brown, and rest of body yellow; pronotal spine thick and as long as the basal face of the propodeum anterior to it (Dominican Republic) ..... ***harlequina***

Major: head square-shaped and exactly as broad as long; body and head concolorous yellow; propodeal spine medium-wide and only one-third as long as the basal face of the propodeum (Guatemala) (see also *subreticulata*) ..... ***breviscapa***

37(35) Major: antennal scrobes absent; body reddish brown (Argentina) ..... ***heterothrix***

Major: antennal scrobes present; body yellow or brown **38**

38 Major: rugoreticulum on dorsal head surface limited to the space between the eye and the antennal fossa (southern Mexico, Costa Rica) (also, check *mittermeieri*)..... ***glomericeps***

Major: rugoreticulum on dorsal head surface limited to small space immediately behind the antennal scrobe (Colombia)..... ***charazana***

39(33) Major and minor: in side view, profile of occiput bears several clavate hairs, the pilosity of the promesonotal dorsum consists almost entirely of several pairs of clavate hairs, and several more clavate hairs occur on the dorsa of the petiolar and postpetiolar nodes (Texas)..... ***constipata***

Major and minor: pilosity of occiput, promesonotum, and waist consists of abundant, non-clavate hairs **40**

40 Major: seen from above and obliquely, pronotal humerus angulate or subangulate..... **41**

Major: seen from above and obliquely, pronotal humerus smoothly rounded..... **43**

41 Major: humeral angle, viewed from above and obliquely, is acute; in side view, frontal lobe extends forward as a prominent, right-angular flange (Costa Rica to Brazil, Peru, and Ecuador) (placed in the *tristis* group; also keyed out here to ensure identification)..... ***cramptoni***

Major: humeral angle obtuse; frontal lobe in side view rounded and not protuberant **42**

42 Major: antennal scrobes present; promesonotal dorsum and anterior half of first gastral tergite foveolate and opaque (Tamaulipas, Mexico)..... ***rectiluma***

Major: antennal scrobes absent; promesonotal dorsum and all of first gastral tergite smooth and shiny (Costa Rica to Amazonian Peru) ..... ***tennantae*** **(in part)**

43(40) Major: rugoreticulum begins at eye level and extends posteriorly to about halfway between the level of the posterior margin of the eye and the level of the occiput, and it also extends to the space ventral to ("behind") the eye (Colombia)..... ***quadriceps***

Major: rugoreticulum limited to the space between the eye and antennal fossa **44**

44 Major: anterior half of pronotal dorsum covered with transverse carinulae **45**

Major: pronotal dorsum entirely free of carinulae..... **46**

45 Major: seen from above, postpetiolar node oval in outline, and sides of the node mostly smooth and shiny. Minor: longitudinal carinulae present behind (ventral to) the eye and those immediately mesad to the eye extend past the posterior margin of the eye by an eye's length; a small amount of reticulum present between eye and antennal fossa (West Indies, introduced into U. S. Gulf States) ..... ***moerens***

Major: seen from above, postpetiolar node trapezoidal in shape, widest near anterior border, and its sides foveolate and opaque. Minor: no carinulae present ventral to eye, and those immediately mesad to the eye do not extend an eye's length past the posterior margin of the eye; no reticulum present on head (Argentina) ..... ***bruchella***

46(44) Major: in side view, a separate mesonotal convexity well developed; seen from above, lateral margins of postpetiolar node angulate (Amazonian Peru) ..... ***sabella***

Major: in side view, mesonotal convexity not separately developed, the promesonotal profile forming a single smooth curve; from above, lateral margins of postpetiolar node rounded..... **47**

47 Major: lower half of mesopleuron foveolate, opaque, and with longitudinal rugulae; occiput bears scattered conspicuous foveae; head bicolored, dark yellow anterior to the eyes and brown behind (Venezuela) ..... ***pariana***

Major: lower half of mesopleuron smooth and shiny; occiput lacking foveae; head concolorous yellow or brown **48**

48 Major: many hairs along dorsal profiles of promesonotum and first gastral tergite 2× eye length; in side view, space between metanotal groove and propodeal spiracle longitudinally rugulate (Amazonian Peru and Ecuador) ..... ***caracalla***

Major: hairs along dorsal profiles of promesonotum and first gastral tergite at most about 1× eye length; in side view, rugulae do not cover the space between the metanotal groove and propodeal spiracle (St. Vincent and Puerto Rico) ..... ***orbica***

49(32) Major and minor: pronotal dorsum completely covered by coarse rugoreticulum (Costa Rica) ..... ***carinata***

Major and minor: pronotal dorsum lacking rugoreticulum **50**

50 Major: pronotal dorsum completely covered by transverse carinulae (Costa Rica) ..... ***brachyops***

Major: pronotal dorsum free of carinulae, or, at most, a few carinulae occur on the anteriormost strip, or humeri, or both **51**

51 Major: rugoreticulum occurs as a band across the dorsum of the head from eye to eye and across the frontal lobes without a break; in side view, posteriormost carinulae departing from anterior margin of the eye travel obliquely downward toward the lower ventral corner of the head (Argentina) ..... ***carapunco***

Major: rugoreticulum interrupted in the center of the dorsum of the head by the longitudinal carinulae of the frontal lobes; in side view, carinulae departing from anterior margin of the eye travel straight forward to the anterior clypeal border or even slightly upward toward the dorsal surface of the head **52**

52 Major: in side view, rugoreticulum completely surrounds the eye and continues ventrally across the gena to the lower margin of the head (Campeche, Mexico) ..... ***dumicola***

Major: in side view, rugoreticulum does not extend all the way around the eye or onto the gena **53**

53 Major: seen from above, margins of postpetiolar node form spines or at least acute angles **54**

Major: seen from above, the postpetiolar node forms an oval or trapezoid, its margins either round or obtuse-angular **60**

54 Major: seen from above, margins of postpetiolar node taper into spines, and the humeri form acute angles that project slightly beyond the margins of the rest of the pronotum beneath them (Arizona) ..... ***furtiva***

Major: seen from above, margins of postpetiolar node are acute-angular but not tapered into spines; humeri do not extend as acute angles beyond margins of rest of pronotum **55**

55 Major: hypostomum bearing 3 teeth; first gastral tergite partly shagreened and opaque **56**

Major: hypostomum bearing 4–5 teeth; first gastral tergite completely smooth and shiny **57**

56 Major: in side view, posterior half of ventral surface of head foveolate and opaque. Minor: in side view, propodeal spine more than half as long as the basal propodeal face anterior to it (Oaxaca, Mexico) ..... ***oaxacana***

Major: in side view, posterior half of ventral surface of head smooth and shiny. Minor: in side view, propodeal spine only one-third as long as the basal propodeal face anterior to it (Veracruz, Mexico) ..... ***scabriventris***

57(55) Major: shallow antennal scrobes present (Arizona) ..... ***juniperae***

Major: shallow antennal scrobes absent **58**

58 Major: posterior half of dorsal surface of head covered by widely spaced, conspicuous, coarse, and piligerous punctures (Mexico City) ..... ***tragica***

Major: posterior half of dorsal surface of head lacks conspicuous piligerous punctures **59**

59 Major: dorsal surface of head bicolored, with occiput and anterior strip of head surface yellow and middle section light brown. Minor: occiput foveolate and opaque to feebly shiny; carinulae immediately mesad to eye extend posteriorly past eye halfway to occipital border (southeastern Mexico) ..... ***chalca***

Major: dorsal surface of head concolorous reddish yellow. Minor: occiput smooth and shiny; carinulae mesad to eye do not extend posteriorly past the eye (Oaxaca, Mexico) ..... ***mixteca***

60(53) Major: concolorous yellow, except for a unique "mask" of light brown that extends across all the head exclusive of the occipital lobes and the genae anterior to the eyes. Minor: nuchal collar present (Costa Rica) ..... ***nasutoides***

Major: species variously yellow to brown; head concolorous or, if bicolored, the contrasting zones are in different shades of brown. Minor: nuchal collar present or absent **61**

61 Major: seen from the side, what appears to be the profile of the metanotal dorsum is a distinct convexity, which separates the mesonotal convexity from the low rise of the propodeal basal face. Minor: nuchal collar present (Santa Catarina, Brazil) ..... ***flavida***

Major: seen from the side, profile of metanotal dorsum is a narrow concave groove, as typical for the genus, with no convexity. Minor: nuchal collar absent **62**

62 Major: seen from the side, profile of lower surface of postpetiole protrudes downward at its anterior end as a blunt right angle; transverse carinulae partly cover anterior third of the pronotal dorsum (Venezuela) ..... ***tachirana***

Major: seen from the side, profile of lower surface of postpetiole straight or slightly concave, not protruding anteriorly as a lobe; at most, very short carinulae occur on the tips of the humeri **63**

63 Major: in full-face view, posterior third of head capsule bears widely spaced, conspicuous piligerous foveae (Amazonian Peru and Ecuador) ..... ***amazonica***

Major: in full-face view, posterior third of head capsule lacks piligerous foveae **64**

64 Major: seen in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view), pronotal humerus raised as a discrete lobe high above the remainder of the promesonotum (Colombia, Brazil, Peru) ..... ***tambopatae***

Major: seen in dorsal-oblique view, humerus does not form a distinct lobe, but instead its profile continues with that of the remainder of the promesonotum to form a smooth semicircle or at most a low, slightly separate lobe **65**

65 Major: a broad rugoreticulum stretches from the eye to the antennal fossa; posterior third of dorsal surface of head foveolate and opaque. Minor: dorsa of head and pronotum foveolate and opaque. Major and minor: reddish yellow (Trinidad) ..... ***trinitatis***

Major: rugoreticulum on dorsal surface of head limited to very small patches next to the outer circular carinulae of the antennal fossa; posterior third of dorsal surface of head smooth and shiny. Minor: head and pronotum smooth and shiny. Major and minor: light to medium brown (Venezuela) ..... ***hedlundorum***

66(31) Major: in full-face view, carinulae and/or rugulae cover all of the posterior half of the dorsal surface of the head up to and including the occipital border with the possible exception of part of the antennal scrobes **67**

Major: in full-face view, at least lateral parts of the occipital lobes or sides of the posterior dorsal surface of the head free of carinulae and rugulae **87**

67 Major: in full-face view, longitudinal carinulae traveling along the lateral thirds of the dorsum of the head turn inward as they approach close to the occiput and curve at least part way across the occipital lobes toward the midline **68**

Major: in full-face view, longitudinal carinulae traveling along the lateral thirds of the dorsum of the head either continue as straight lines to the occipital border or turn outward as they approach close to the occipital lobes **71**

68 Major: inward-curving carinulae on occiput meet one another at the midline **69**

Major: inward-curving carinulae on occiput approach one another from both sides of the head but do not meet at the midline **70**

69 Major: in side view mesonotal convexity absent; posterior dorsal profile of head convex. Minor: promesonotum smooth and shiny (São Paulo, Brazil) ..... ***borgmeieri***

Major: in side view mesonotal convexity present; posterior dorsal profile of head slightly concave. Minor: promesonotum foveolate and opaque (Veracruz, Mexico) **70**

70 Major: in side view, dorsal profile of promesonotum flat most of its length until it descends almost vertically to the metanotal groove; seen from above, lateral margins of postpetiolar node rounded. Minor: in full-face view, carinulae mesad to the eye continue posteriorly to near the occipital border (Mexico to Amazonian Peru) ..... ***striaticeps***

Major: in side view, promesonotal dorsal profile strongly convex and descends very gradually to the metanotal groove; seen from above, lateral corners of postpetiolar node right-angulate. Minor: in full-face view, there are no carinulae mesad to the eye (Amazonian Peru and Ecuador) ..... ***cardiella***

71(67) Major: in full-face view, longitudinal carinulae originating on the frontal lobes curve strongly outward (laterad) from each other as they cross the occipital lobes (Cuba) ..... ***neolongiceps***

Major: in full-face view, longitudinal carinulae traveling over the posterior dorsum continue straight or weakly outwardly curving until they reach the occipital margin or rugulae on the margin **72**

72 Major and minor: in side view, the propodeal spine is as long as or longer than the basal propodeal face anterior to it **73**

Major and minor: in side view, the propodeal spine is at most only half as long as the basal propodeal face anterior to it **74**

73 Major: humeri bluntly right-angular and covered by short carinulae; head concolorous yellow; first gastral tergite smooth and shiny (Colombia) (placed in the *punctatissima* group; also keyed out here to ensure identification) ..... ***cataphracta***

Major: humeri smoothly rounded and free of carinulae; head in full-face view strikingly bicolored, with occiput and center of clypeus medium brown and rest of the surface brownish yellow; first gastral tergite almost completely shagreened and opaque (Dominican Republic) ..... ***drepanon*** **(in part)**

74(72) Major: longitudinal carinulae on dorsal surface of head break up into irregular, fragmented rugulae toward occiput (Ecuador) ..... ***palenquensis***

Major: longitudinal carinulae on dorsal surface of head continue posteriorly to the occipital border without breaking up into irregular fragmented rugulae **75**

75 Major: in full-face view, the carinulae laterally adjacent to the circular carinulae of the antennal fossae travel obliquely away from the circular carinulae to the eye and margin of the head on either side of the eye (Texas) ..... ***mera***

Major: in full-face view, the carinulae laterally adjacent to the circular carinulae of the antennal fossae travel parallel to the long axis of the head past the eye and continue straight for most or all the entire length of the head **76**

76 Major: pronotal dorsum lacks carinulae **77**

Major: pronotal dorsum covered at least in part by transverse carinulae 79

77 Major: in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view), the pronotal humerus is smoothly rounded and forms part of the circular profile of the entire promesonotum (Colombia) ..... ***servilia***

Major: in dorsal-oblique view, the humerus forms a blunt obtuse angle **78**

78 Major: in full-face view, tip of antenna touches the lateral margin of the head less than halfway from the level of the eye to the level of the occipital border; antennal scrobe present (Costa Rica, Mexico) ..... ***chloe***

Major: in full-face view, tip of antenna touches the lateral margin of the head three-fourths the distance from the level of the eye to the level of the occiput; antennal scrobe absent (Costa Rica) ..... ***onyx***

79(76) Major: lower half of sides of pronotum lined with longitudinal carinulae **80**

Major: lower half of sides of pronotum lacking carinulae **82**

80 Major: antennal scrobes present; mesopleuron at least partly rugulose (Bolivia) ..... ***mittermeieri***

Major: antennal scrobes absent; mesopleuron smooth or foveolate (southeastern Brazil) **81**

81 Major: mesonotal dorsum carinulate ..... ***tetrica***

Major: mesonotal dorsum bearing scattered, fragmented rugulae, lacking carinulae (Mato Grosso, Brazil) ..... ***subreticulata***

82(79) Major: antennal scrobes present and free of carinulae **83**

Major: antennal scrobes absent, or, if present, entirely lined with longitudinal carinulae **85**

83 Major: pronotum smooth and shiny. Minor: longitudinal carinulae immediately mesad to the eye exceeding its posterior margin by 1× the eye length or more (Texas) ..... ***nuculiceps***

Major: pronotum foveolate and opaque. Minor: longitudinal rugulae immediately mesad to the eye not exceeding the posterior margin of the eye **84**

84 Major: in full-face view, longitudinal carinulae originating on the frontal lobes become indistinct along the occipital border, and along their entire length the interspaces separating them are only sparsely foveolate and weakly shiny to subopaque (Panama) ..... ***kuna***

Major: in full-face view, longitudinal carinulae originating on the frontal lobes continue strongly all the way to the occipital border; the interspaces along the last fourth of their length are heavily foveolate and opaque (Amazonian Brazil and Peru) ..... ***pholeops***

85(82) Major: sides of pronotum entirely smooth and shiny (Bolivia, Brazil, Peru) ..... ***asperithorax***

Major: sides of pronotum largely foveolate and opaque **86**

86 Major: in side view, carinulae originating from center of dorsal (mesal, on side toward antennal fossa) margin of eye descend obliquely and forward to the antennal fossa; seen from above, lateral margins of postpetiolar node rounded (southern Brazil) ..... ***victima***

Major: in side view, carinulae originating from center of dorsal (mesal) margin of eye descend parallel to the long axis of the head to the anterior margin of the head; seen from above lateral margins of postpetiolar node angulate (Argentina) ..... ***alacris***

87(66) Major: in full-face view, longitudinal carinulae present on frontal lobes, and circular carinulae surround the antennal fossae, but carinulae and rugulae are entirely absent from the rest of the head; extremely small (Head Width 0.6 mm) (Amazonian Peru) ..... ***micridris***

Major: in full-face view, longitudinal carinulae present between eye and circular carinulae around the antennal fossae, and often elsewhere on the head as well; Head Width rarely if ever less than 0.7 mm **88**

88 Major: head shaped like an arrowhead: in full-face view, with mandibles included, head is almost perfectly heart-shaped, and in side view the head capsule is elongate, very flattened, and subrectangular, i.e., the dorsal profile straight, the ventral profile very feebly convex, almost straight, and the length of the capsule in side view over 2.5× its width at transect of maximum depth (Costa Rica) ..... ***sagittaria***

Major: head shaped unlike arrowhead; in side view the head capsule is only 2× as long as or less than its width at transect of maximum width **89**

89 Major: in side view, carinulae or rugulae originating on the dorsal (mesal, facing antennal fossa) margin of the eye descend obliquely and anteriorly to the edge of the antennal fossa **90**

Major: in side view, carinulae or rugulae originating on the dorsal (mesal) margin of the eye descend parallel to the long axis of the head or in a slightly oblique direction to the anterior margin of the head capsule **94**

90 Major: in side view, distance from eye to anterior margin of the head capsule is less than the eye length; linear sculpture traveling from the dorsal margin of the eye (and just behind it) to the antennal fossa consists mostly of rugulae (wavy lines) (Costa Rica, Panama) ..... ***olsoni***

Major: in side view, distance from eye to anterior margin of head capsule is 1.5× the eye length or more; linear sculpture from the dorsal margin of the eye (and just behind it), to the antennal fossa consists entirely of carinulae (nonwavy lines) **91**

91 Major: pronotal dorsum smooth and shiny **92**

Major: pronotal dorsum foveolate and opaque **93**

92 Major: mesopleuron covered by longitudinal carinulae; a shallow faint antennal scrobe present. Minor: in full-face view, posterior third of head smooth and shiny (Venezuela) ..... ***styrax***

Major: mesopleuron smooth and shiny, free of carinulae; antennal fossa absent. Minor: in full-face view, posterior third of head covered by faint longitudinal carinulae, and also foveolate and opaque (Pará, Brazil) ..... ***bidens***

93(91) Major: in full-face view, carinulae immediately mesad to eye extend posteriorly beyond eye to more than halfway the distance from the level of the posterior margin of the eye to the level of the occipital lobe; seen from above, postpetiolar node trapezoidal, with greatest width at the anterior border (Veracruz, Mexico) ..... ***tillandsiarum***

Major: in full-face view, carinulae immediately mesad to eye extend posteriorly beyond eye only to about one-third the distance from the level of the posterior margin of the eyes to the level of the occipital lobes; seen from above, postpetiolar node is widest at the center (Colombia) ..... ***grex***

94(89) Major: seen from directly above, humeri extend well beyond the lateral profile of the pronotum beneath them, forming prominent acute angles; seen from above and obliquely, the humerus and mesonotal convexity form equal-sized and small but conspicuous teeth. Minor: seen in side view, the corner of the basal and posterior faces of the mesonotal dorsum forms an acute tooth, and the posterior mesonotal face descends in a nearly vertical line that is almost as long as the basal face posterior to it (Costa Rica, Panama) ..... ***multispina***

Major: seen from directly above, humeri do not project beyond the lateral profile of the pronotum beneath them; seen from above and obliquely, the humerus and mesonotal convexity do not form equal-sized teeth. Minor: seen from the side the mesonotal posterior face does not descend in a long vertical line as described above **95**

95 Major: seen in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view), the humerus is extended as a large acute or right angle or lobe that projects more than 2× the height above the line of the rearmost convexity of the promesonotum behind it relative to the metanotal groove **96**

Major: seen in dorsal-oblique view, humerus either is smoothly continuous with the rest of the promesonotum or forms a relatively low convexity or rounded obtuse angle 2× or less higher than the line of the rearmost convexity of the promesonotum behind it, relative to the metanotal groove **107**

96 Major: seen from above, lateral margins of postpetiolar node taper into spines or acute angles; at least part of the anterior half of median strip of first gastral tergite shagreened and opaque (Mexico, Central America, northern South America, West Indies) **97**

Major: seen from above, postpetiolar node oval or trapezoidal, with rounded lateral or obtusely angular margins; first gastral tergite entirely smooth and shiny **98**

97 Major: lateral postpetiolar margins spinose; head lacking brown spot in center of dorsum. Minor: first gastral tergite shagreened and opaque (widespread, Mexico to Central America, and West Indies) (see also *floridana* and *stomachosa,* couplet 156) ..... ***bilimeki***

Major: lateral postpetiolar margins acute-angulate, but not drawn into spines; brown spot present in center of head dorsally. Minor: first gastral tergite almost entirely smooth and shiny (Costa Rica) (see also *flavifrons*) ..... ***daphne***

98(96) Major: hypostomal border with 2 teeth; propodeal spiracle very large, wider than the base of the propodeal spine viewed from the side and half as wide as the length of the eye (Amazonian Bolivia, Brazil, and Peru) (placed in the *tristis* group; also keyed out here to ensure identification) ..... ***polita***

Major: hypostomal border with 4–5 teeth; propodeal spiracle not as wide as base of the propodeal spine seen from the side or half the eye length **99**

99 Major: promesonotal dorsum entirely foveolate and opaque **100**

Major: promesonotal dorsum mostly or entirely smooth and shiny **101**

100 Major: seen from above, postpetiolar node oval and foveolate. Minor: carinulae absent from head directly anterior to eye and from all but the lateral margins of the frontal lobes (Colombia, Brazil) ..... ***arhuaca*** **(in part)**

Major: seen from above, postpetiolar node trapezoidal, with obtusely angular lateral margins, and smooth and shiny. Minor: carinulae present anterior to eye and over all the frontal lobes (Colombia) ..... ***mincana***

101(99) Major: pronotal dorsum completely free of carinulae **102**

Major: at least anterior fourth of pronotal dorsum partly or entirely covered with transverse carinulae **104**

102 Major: side of pronotum completely foveolate and opaque. Minor: dorsal surfaces of head and pronotum completely foveolate and opaque (Costa Rica) ..... ***caulicola***

Major: side of pronotum completely smooth and shiny. Minor: dorsal surfaces of head and pronotum completely smooth and shiny **103**

103 Major: head elongate (Head Length 1.3× Head Width) and lacks ocelli; seen from above and obliquely, promesonotal profile forms a large triangle, with the base only slightly longer than the sides, and lacking a tooth (Texas) ..... ***humeralis***

Major: head ordinary in proportion (Head Length 1.1× Head Width); median ocellus present; seen from above and obliquely, promesonotal profile not triangular, instead surmounted by a small obtusely angular tooth (Ecuador) ..... ***viriosa*** **(in part)**

104(101) Major: longitudinal carinulae on frontal lobes extend posteriorly past the level of the posterior margin of the eye by only 1.5× the eye length. Minor: in full-face view, head narrowed strongly at occiput; occipital margin straight, and followed by nuchal collar (Costa Rica) ..... ***erratilis***

Major: longitudinal carinulae on frontal lobes extend posteriorly past the level of the posterior margin of the eye by at least 2× the eye length. Minor: in full-face view, occiput broad and concave, and lacks nuchal collar **105**

105 Major: humeri with small patches of rugoreticulum; in full-face view, head weakly bicolored, with dark yellow anterior half and light brown posterior half (Mexico, Ecuador) ..... ***chalcoides*** **(in part)**

Major: humeri lack patches of rugoreticulum; head concolorous reddish yellow or light brown or weakly bicolored **106**

106 Minor: seen in dorsal-oblique view, apex of humerus forms a sharkfin, right-angular lobe; carinulae immediately mesad to eye extend posteriorly only about an eye length (Brazil, Bolivia, Venezuela) ..... ***schmalzi***

Minor: seen in dorsal-oblique view, profile of humerus is prominent but its apex is obtuse, not a right-angular sharkfin; carinulae immediately mesad to the eye extend posteriorly 2× or more than the length of the eye (Costa Rica) ..... ***angulifera***

107(95) Major: at least part of the mesopleuron covered by rugulae or rugoreticulum **108**

Major: mesopleuron smooth, or foveolate, or carinulate, but not rugulate or rugoreticulate..... **111**

108 Major: lower half of mesopleuron completely covered by rugoreticulum and irregular rugulae (Costa Rica)..... ***petersoni***

Major: lower half of mesopleuron completely smooth or covered at most (and then only partly) by longitudinal carinulae **109**

109 Major: in full-face view, carinulae covering frontal lobes extend posteriorly to within one to 2 eye-lengths of the occiput (French Guiana)..... ***moffetti***

Major: in full-face view, carinulae covering frontal lobes extend to no more than halfway between the level of the eyes and level of the occipital margin..... **110**

110 Major: humeri rugoreticulate; lower half of mesopleuron completely covered by longitudinal carinulae; posterior third of dorsum of head capsule dotted by sparse but conspicuous foveate (Panama) ..... ***umphreyi***

Major: humeri lacking rugoreticulae; lower half of mesopleuron smooth; posterior third of dorsum of head capsule lacks foveae (Brazil, in nests of *Dinoponera*) (see also *quercicola*)..... ***dinophila***

111(107) Major: in side view, propodeal spine is greatly reduced, its height no greater than the width of the propodeal spiracle and its apex forming a right or obtuse angle..... **112**

Major: in side view, propodeal spine is well developed, longer than the width of the propodeal spiracle and its apex, forming an acute angle..... **116**

112 Major: in full-face view, carinulae originating on frontal lobes extend posteriorly to midway between the level of the eyes and level of the occipital margin; anterior half of the pronotal dorsum covered by transverse carinulae (Costa Rica) ..... ***cerina***

Major: in full-face view, carinulae originating on frontal lobes, if present, do not extend posteriorly more than a quarter of the distance between the level of the eyes and the level of the occiput; pronotal dorsum lacks carinulae **113**

113 Major: in full-face view, longitudinal carinulae completely cover the frontal lobes, and others originate from the posterior border of the frontal triangle (Colombia)..... ***pygmaea***

Major: in full-face view, longitudinal carinulae cover at most only part of the frontal lobes, and none originates from the posterior border of the frontal triangle **114**

114 Major: seen from above, lateral margins of the postpetiolar node form acute angles; in side view, some of the hairs fringing the dorsal mesosomal profile are longer than the eye (Panama)..... ***melastomae***

Major: seen from above, lateral margins of the postpetiolar node smoothly rounded; hairs fringing the mesosomal profile are all shorter than the eye **115**

115 Major: most of the frontal lobes are covered by longitudinal carinulae. Minor: in full-face view, antennal scapes exceed the occipital corners by more than their own maximum width (Ecuador)..... ***exquisita***

Major: only faint longitudinal carinulae occur on the frontal lobes, and these are limited to the lateral margins of the lobes. Minor: in full-face view, antennal scapes just reach the antennal corners (Costa Rica to Brazil and Ecuador) ..... ***nitella***

116(111) Major: in side view, propodeal spine longer than the basal face of the propodeum anterior to it; dorsal surface of head bicolored, with clypeus and occiput brown and rest of head brownish yellow (Dominican Republic) ..... ***drepanon*** **(in part)**

Major: in side view, propodeal spine much shorter than the basal face of the propodeum anterior to it; color of dorsal face of head not as described above **117**

117 Major: in full-face view, longitudinal carinulae originating on frontal lobes, including those along the dorsal midline of the head, extend all the way to the occipital border (West Indies to northern South America) ..... ***sculptior***

Major: in full-face view, longitudinal carinulae originating on frontal lobes, except occasionally those directly next to the head capsule midline, fail to reach the occipital border by at least the length of the eye **118**

118 Major: in full-face view, surface of the dorsum of the head posterior to the longitudinal carinulae completely foveolate and opaque **119**

Major: in full-face view, surface of the dorsum of the head posterior to the longitudinal carinulae at most with scattered foveae, and largely smooth and shiny **129**

119 Major: in full-face view, longitudinal carinulae limited to the outer margins of the frontal lobes and do not reach posteriorly beyond the level of the posterior margins of the eyes (Ecuador) ..... ***geminata***

Major: in full-face view, longitudinal carinulae cover all of the frontal lobes and extend posteriorly beyond the level of the posterior margin of the eyes by 1× the Eye Length or more **120**

120 Major: in side view, distance from anterior border of the gena to the eye about 1.2× the Eye Length or less **121**

Major: in side view, distance from anterior border of the gena to the eye 1.5× the Eye Length or more **123**

121 Major: seen from above, the lateral margins of the postpetiolar node are spinose, and the node is 2× wider than the petiolar node (Veracruz, Mexico) ..... ***tenebra***

Major: seen from above, the lateral margins of the postpetiolar node are rounded, and the node is only 1.5× wider than the petiolar node (Costa Rica) **122**

122 Major: shallow antennal scrobes present; eye oval. Minor: distance from anterior border of the gena to the eye less than half the Eye Length ..... ***browni***

Major: antennal scrobes absent; eye reniform, with concave ventral border. Minor: distance from anterior border of the gena to the eye about equal to the Eye Length ..... ***hizemops***

123(120) Major: promesonotal dorsum entirely smooth and shiny (Costa Rica) **124**

Major: promesonotal dorsum mostly or entirely foveolate and opaque **125**

124 Major: in side view, propodeal spine forms a 90-degree angle with the basal face of the propodeum anterior to it. Minor: dorsal surface of head foveolate and opaque. Major and minor: yellow ..... ***beloceps***

Major: in side view, propodeal spine pointed posteriorly, forming about a 135-degree angle with the basal face of the propodeum anterior to it. Minor: dorsal surface of head smooth and shiny. Major and minor: dark brown ..... ***nigricula***

125(123) Major: in full-face view, longitudinal carinulae arising on frontal lobes extend posteriorly for at least four-fifths the distance from the level of the eyes to the level of the occipital border **126**

Major: in full-face view, longitudinal carinulae arising on frontal lobes extend posteriorly for no more than two-thirds the distance from the level of the eyes to the level of the occipital border **127**

126 Major and minor: in side view, mesonotal convexity well developed, its height at least three-fourths as great as the length of the propodeal spine. Major and minor: color reddish yellow (Amazonian Peru) ..... ***meinertopsis***

Major and minor: in side view, mesonotal convexity very low and indistinct, less than one-fourth as high as the propodeal spine is long; color dark brown (Costa Rica, Belize) ..... ***rectispina***

127(125) Major: seen from above, lateral margins of postpetiolar node tapered into blunt-tipped spines; almost all of first gastral tergite foveolate and opaque (Costa Rica) ..... ***nebulosa***

Major: seen from above, lateral margins are right-angular or acute-angular but not tapered into spines; first gastral tergite entirely smooth and shiny **128**

128 Major: in full-face view, longitudinal carinulae originating on frontal lobes reach posteriorly more than half the distance from the level of the eyes to the level of the occipital margin; head roughly heart-shaped, with Head Width equaling Head Length. Minor: seen from above and obliquely, pronotal humerus surmounted by a right-angular tooth (Rio de Janeiro, Brazil) ..... ***goeldii***

Major: in full-face view, longitudinal carinulae originating on frontal lobes reach posteriorly less than one-fourth the distance from the level of the eye to the level of the occipital margin; head subrectangular, with Head Width 1.1× Head Length. Minor: lacks tooth on humerus (Costa Rica) ..... ***specularis***

129(118) Major: edges of pronotal humeri bear small patches of rugoreticulum **130**

Major: edges of pronotal humeri lack rugoreticulum **132**

130 Major: promesonotum smooth and shiny; head capsule weakly bicolored, with anterior half brownish yellow and posterior half light brown. Minor: longitudinal carinulae originating on frontal lobes reach posteriorly almost halfway between level of eyes and level of occipital margin (Veracruz, Mexico) ..... ***chalcoides*** **(in part)**

Major: promesonotum foveolate and opaque; head capsule concolorous yellow. Minor: longitudinal carinulae on frontal lobes either absent or, if present, do not extend posteriorly beyond level of the eyes **131**

131 Major: in side view, eye longer than the distance from its anterior border to the anterior border of the gena directly before it, and tapered posteriorly to a blunt acute angle. Minor: in side view, propodeal spine pointed strongly backward, its anterior surface nearly parallel with the basal face of the propodeum anterior to it (montane Colombia) ..... ***euryscopa***

Major: in side view, eye only two-thirds as long as the distance from its anterior border to the anterior border of the gena directly before it, and oval in shape. Minor: in side view, propodeal spine forms about a 135-degree angle with the basal face of the propodeum anterior to it (this applies to the rugoreticulum-free form of *flavens,* which varies through intermediates to a form possessing an extensive rugoreticulum on the head; see also couplet 27) (widespread and abundant throughout the American tropics, and, possibly as an adventive, also occurs in Florida; often carried accidentally by commerce) ..... ***flavens*** **(in part)**

132(129) Major: in side view, transverse carinulae on the anterior half of the pronotal dorsum curve posteriorly, and transverse carinulae on the posterior half curve anteriorly, so that the two groups of carinulae meet to form semicircles along the side of the pronotum (Buenos Aires, Argentina) ..... ***atticola***

Major: in side view, carinulae on the pronotum absent, or, if present, do not form semicircular patterns on the side of the pronotum **133**

133 Major: in side view, mesosoma (thorax plus propodeum) variably carinulate but completely devoid of foveolae or at most with a very small patch along the upper metanotal groove, its surface uniformly smooth and shiny **134**

Major: in side view, at least the upper half of the propodeum, or the mesopleuron, or both, and often extensive additional areas as well, foveolate and opaque **144**

134 Major: in full-face view, the longitudinal carinulae mesad to the eyes reach posteriorly to three-fourths or more the distance from the level of the posterior margins of the eye to level of the occipital margin **135**

Major: in full-face view, the longitudinal carinulae mesad to the eyes at most reach halfway the distance from the level of the posterior margins of the eyes to the level of occipital margin **136**

135 Major and minor: in side view, the promesonotal profile is mostly flat and descends abruptly at the posterior end as a distinct oblique face to meet the metanotal groove (Argentina) ..... ***tarchon***

Major and minor: in side view, entire promesonotal profile forms the arc of a circle, with no distinct posterior face (Mato Grosso, Brazil) ..... ***nana***

136(134) Major: dorsal profile of head fringed by only a dozen or so hairs and dorsal profile of mesosoma (thorax plus propodeum) by only several; hypostomal border with only 2 teeth (Guatemala) (placed in the *pilifera* group; also keyed out here to ensure identification) ..... ***defecta***

Major: dorsal profiles of head and mesosoma fringed by abundant hairs; hypostomal border with 5 teeth **137**

137 Major: in side view, dorsal profile of middle of promesonotum flat or at most slightly convex, and dropping to the metanotal groove through a steep posterior face **138**

Major: in side view, dorsal profile of middle of promesonotum strongly convex, forming a single semicircular line that does not include a distinct posterior face **140**

138 Major: very small (Head Width 0.8 mm); seen in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view), pronotal humerus subangulate; seen from above, lateral margins of postpetiolar node rounded (Costa Rica) ..... ***arboricola***

Major: moderately small (Head Width 1.0–1.1 mm); seen in dorsal-oblique view, pronotal humerus either expanded as a lobe or evenly rounded with no projection; seen from above, lateral margins of postpetiolar node angulate **139**

139 Major: parallel carinulae are present along ventral border of pronotum, and a few rugulae are present in center of mesopleuron. Minor: carinulae present immediately mesad to eye. Major and minor: body yellow (Guerrero, Mexico) ..... ***quercicola***

Major: carinulae and rugulae absent from ventral border of pronotum and mesopleuron. Minor: carinulae absent immediately mesad to eye. Major and minor: body light brown (Cuba) ..... ***similigena***

140(137) Major: seen from above, short transversely oriented carinulae line the lateral margins of the pronotal humeri; seen from above and obliquely, profile of humerus raised into a lobe distinct from the rest of the pronotal profile; head capsule yellow with a dark circular spot in the center of its dorsal surface (Virginia to Ohio, Arizona, Chihuahua, Mexico) ..... ***tysoni***

Major: seen from above, the lateral margins of the pronotal dorsum lack carinulae; seen from above and obliquely, humerus profile a smoothly convex part of the pronotal profile, not raised as a lobe; dorsal surface of head lacks a central spot **141**

141 Major: body dark, almost blackish brown. Minor: distance between anterior margin of eye and anterior margin of gena directly in front of it only half as great as the Eye Length (Costa Rica, Colombia) ..... ***ebenina***

Major: body medium brown or yellow. Minor: distance between anterior margin of eye and anterior margin of gena directly in front of it at least as great as the Eye Length **142**

142 Major: in full-face view, longitudinal carinulae on frontal lobes limited to the outer (lateral) margins, and the carinulae immediately mesad to the eyes do not extend beyond the level of the posterior margin of the eyes (Ecuador) ..... ***crinita***

Major: in full-face view, longitudinal carinulae occur over all of the frontal lobes, and the carinulae immediately mesad to the eyes extend beyond the posterior margins of the eyes for at least twice the eye length **143**

143 Major: in full-face view, only a half dozen or so widely spaced longitudinal carinulae cover the frontal lobes; a small patch of foveolae occurs in the space directly above the mesothoracic spiracle; body yellow (Haiti, Dominican Republic) ..... ***terresi***

Major: in full-face view, more than a dozen crowded longitudinal carinulae cover the frontal lobes; no foveolae occur above the mesothoracic spiracle; body yellow or medium brown (Costa Rica to Ecuador) ..... ***laselva***

144(133) Major: longitudinal carinulae passing between the eyes and frontal lobes seen in full-face view extend posteriorly to at least three-fourths the distance from the level of the posterior margin of the eye to the level of the occipital border **145**

Major: longitudinal carinulae passing between the eyes and frontal lobes seen in full-face view extend posteriorly at most about halfway between the level of the posterior margin of the eyes and the level of the occipital border **152**

145 Major: shallow antennal scrobes present; in side view, posterior face of promesonotum almost vertical; color reddish yellow (Central and South America to Bolivia, West Indies) ..... ***exigua***

Major: antennal scrobe absent; in side view, posterior face of promesonotum descends gradually to the basal propodeal face, with which it forms an angle of about 135 degrees; color variable **146**

146 Major: promesonotal dorsum foveolate and opaque **147**

Major: promesonotal dorsum smooth and shiny **149**

147 Major: promesonotal dorsum free of carinulae (Colombia) ..... ***micon***

Major: at least the anterior half of the promesonotal dorsum covered by transverse carinulae **148**

148 Major: in full-face view, head is heart-shaped; in side view, propodeal spine forms a 90-degree angle with the basal propodeal face anterior to it, and its apex is curved slightly forward (Colombia, Ecuador)..... ***hazenae***

Major: in full-face view, head is subrectangular; in side view, propodeal spine forms a 135-degree angle with basal propodeal spine, and its apex is curved slightly to the rear (Colombia)..... ***alticola***

149(146) Major: ventral half of mesopleuron foveolate and opaque; in side view, posterior half of dorsal profile of head bears only several very short hairs, which are recumbent and forward-directed (Costa Rica)..... ***ulothrix***

Major: ventral half of mesopleuron smooth and shiny; pilosity on dorsal profile of head longer and mostly erect to suberect..... **150**

150 Major: occiput sprinkled with sparse but conspicuous foveae; head bicolored, with anterior third dark yellow and posterior two-thirds dark brown (Costa Rica to Amazonian Peru)..... ***tennantae* (in part)**

Major: occiput lacking foveae; head concolorous yellowish brown or dark brown..... **151**

151 Major: promesonotum completely free of carinulae; in full-face view, longitudinal carinulae on posterior half of head curve slightly mesad toward the midline of the head; color dark brown (Costa Rica)..... ***monteverdensis***

Major: parallel transverse carinulae line the anterior fringe of the pronotum; in full-face view, longitudinal carinulae on posterior half of head remain straight throughout; color yellowish brown (Costa Rica)..... ***dryas***

152(144) Major: seen from above, lateral margins of postpetiolar node tapers into spines, or at least they form acute angles..... **153**

Major: seen from above, postpetiolar node is oval or trapezoidal, and its margins are rounded or form obtuse or at most right angles..... **157**

153 Major: in side view, a distinct mesonotal convexity is lacking; the center of the dorsal promesonotal profile is flat, descending posteriorly through an oblique face to the metanotal groove..... **154**

Major: in side view, a low mesonotal convexity is visible, breaking the otherwise convex dorsal profile near the center of the promesonotum..... **155**

154 Major: head elongate, Head Length 1.6× Head Width; pronotum smooth and shiny (Texas)..... ***casta***

Major: head of ordinary proportions, Head Length 1.1× Head Width; pronotum foveolate and opaque (Morelos, Mexico)..... ***morelosana***

155(153) Major: pronotal dorsum completely covered by transverse carinulae; in side view, hairs lining posterior half of dorsal profile of head are much shorter than the Eye Length (Argentina)..... ***breviseta***

Major: at most, transverse carinulae line the anterior fringe of the pronotal dorsum; in side view, hairs lining posterior half of the dorsal profile of the head area as long as the eye or longer..... **156**

156 Major: in full-face view, longitudinal carinulae immediately mesad to the eye extend posteriorly nearly half the distance from the level of the posterior margin of the eye to the level of the occipital border. Minor: posterior half of dorsal surface of head, and all of pronotum, smooth and shiny; antennal scapes extending well past posterior occipital corners (Jamaica) (see also *bilimeki*) ..... ***stomachosa***

Major: in full-face view, longitudinal carinulae immediately mesad to the eye extend posteriorly less than a quarter the distance from the level of the posterior margin of the eye to the level of the occipital border. Minor: posterior half of the dorsal surface of head, and all of pronotum, foveolate and opaque; antennal scapes barely reaching occipital corners (Florida to Texas) (see also *bilimeki*) ..... ***floridana***

157(152) Major: in side view, propodeal spines appear "melted"—blunt at the tip and curved strongly backward; antennal scape reaches the occipital corners (Costa Rica) ..... ***citrina***

Major: in side view, propodeal spine sharp-tipped and straight or at most very slightly curved; antennal scape reaches only to within three-fourths the distance to the occipital border **158**

158 Major: pronotal dorsum foveolate and opaque **159**

Major: pronotal dorsum mostly or entirely smooth and shiny **163**

159 Major: in full-face view, longitudinal carinulae originating on the posterior margin of the frontal triangle reach all the way along the midline of the head to the occipital border (Bolivia) ..... ***boliviana***

Major: in full-face view, longitudinal carinulae originating on the posterior margin of the frontal triangle fail to reach all the way to the occipital margin **160**

160 Major: promesonotal dorsum entirely covered by faint longitudinal carinulae (Colombia, Amazonian Brazil) ..... ***guajirana***

Major: promesonotal dorsum lacks carinulae **161**

161 Major: in full-face view, posterior half of head sprinkled with sparse but conspicuous foveae; in side view, promesonotal profile descends to metanotal groove by a nearly vertical face (Chiapas, Mexico) ..... ***mackayi***

Major: in full-face view, posterior half of head lacks foveae; in side view, promesonotal profile descends to metanotal groove gently, forming an angle of about 135 degrees with the basal face of the propodeum **162**

162 Major: seen in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view), pronotal humerus surmounted by a subtriangular tooth; body color yellow (Colombia, Brazil) ..... ***arhuaca* (in part)**

Major: seen in dorsal-oblique view, humerus surmounted by a broad, evenly curved lobe; body color reddish brown (Costa Rica) ..... ***scitula***

163(158) Major: in full-face view, carinulae between eyes and frontal lobes extend posteriorly just to the level of the posterior margins of the eyes (Trinidad) ..... ***tenerescens***

Major: in full-face view, carinulae between eyes and frontal lobes extend posteriorly beyond the posterior margin of the eye for a distance of at least the Eye Length **164**

164 Major: in side view, propodeal spine forms a 90-degree angle with the basal face of the propodeum, and its tip is straight or curved slightly forward; in side view, profile of posterior half of dorsum of head, exclusive of the occiput, very slightly concave (Costa Rica) ..... ***amabilis***

Major: in side view, propodeal spine forms an angle of 135 degrees or more with the basal face of the propodeum, and its tip is either straight or curved slightly backward..... **165**

165 Major: head yellow with large but fuzzily-bordered brown or dark yellow spot in the center of its dorsal surface **166**

Major: head lacking a contrasting brown or dark yellow spot in the center of its dorsal surface..... **170**

166 Major: in full-face view, head tricolored, with dark brown circular spot in center of head, the remaining posterior two-thirds yellowish brown, and the anterior third yellow (Amazonian Peru, Nicaragua) ..... ***flavifrons***

Major: in full-face view, head bicolored, with contrasting spot in the center and the remainder concolorous brown or yellow..... **167**

167 Major: seen in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view), pronotal humerus surmounted by a small triangular tooth (Ecuador) ..... ***viriosa* (in part)**

Major: seen in dorsal-oblique view, pronotal humerus either obtusely subangular or else smoothly rounded, not bearing a tooth **168**

168 Major: shallow antennal scrobe present (Venezuela) (placed in the *tristis* group; also keyed out here to ensure identification) ..... ***eparmata***

Major: antennal scrobe absent..... **169**

169 Major: seen from the side, propodeal spine slightly curved posteriorly; hairs on the dorsal profile of the promesonotum not exceeding 1.5× the Eye Length (Panama)..... ***mallota***

Major: seen from the side, propodeal spine straight; some of the hairs on the promesonotal profile 2× the Eye Length (Ecuador)..... ***ecuadorana***

170(165) Major: lower half of mesopleuron foveolate and opaque..... **171**

Major: lower half of mesopleuron smooth and shiny..... **172**

171 Major: seen from above, pronotal humeri extend out prominently to create subangulate profiles; body brownish yellow. Minor: seen from above and obliquely, humerus bears short obtuse-angular tooth from whose apex emerges a single long hair (southern Mexico, Costa Rica) ..... ***sagana***

Major: seen from above, humeri not protuberant, and lateral margins of pronotum form near-perfect semicircles; body dark brown. Minor: humerus not surmounted by piligerous tooth (Costa Rica)..... ***lustrata***

172(170) Major: seen from above, transverse carinulae cover anterior fringe of the pronotal dorsum **173**

Major: pronotal dorsum free of carinulae **174**

173 Major: in side view, the propodeal spiracle is longer than the height of the propodeal spine, which is short and has the outline of an equilateral triangle (Costa Rica, Nevis and Jamaica in West Indies)..... ***nitidicollis***

Major: in side view the spiracle is small, much shorter than the height of the needle-shaped propodeal spine (Bolivia, Peru, Argentina) (placed in the *tristis* group; also keyed out here to ensure identification) ..... ***nigella***

174(172) Major: seen in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view), profile of humerus forms a blunt, oblique angle; hairs lining dorsal profile of mesosoma (thorax plus propodeum) are short, not as long as eye; yellow (Brazil, Guyana) ..... ***minutula***

Major: seen from dorsal-oblique view, profile of humerus lobose; many of the hairs lining dorsal profile of mesosoma longer than Eye Length; body dark brown **175**

175 Major and minor: in side view, promesonotal profile rises slightly to a low but distinct obtuse angle at about the midpoint. Major: head bicolored, with anterior third brownish yellow and posterior two-thirds dark brown (Bolivia) ..... ***delicata***

Major and minor: in side view, promesonotal profile smoothly rounded at the midpoint; head concolorous dark brown (São Paulo, Brazil) ..... ***lucaris***

The *gertrudae* Group

This small complex, known so far only from South America, is most similar to the *diligens* group—from among whose members it is likely derived—but is easily distinguished by the lack of a discrete mesonotal convexity; large propodeal spiracles; long, dense pilosity; and absence of propodeal spines in the minor worker (but not necessarily in the major worker).

1 Major: sculpturing on head partly rugoreticulate; pronotum bears parallel longitudinal carinulae. Minor: in side view, basal and descending (posterior) faces of propodeum meet in a right angle (Amazonian Brazil) ..... ***jeannei***

Major: sculpturing of head consists entirely of carinulae, with no reticulation; pronotum lacking carinulae. Minor: in side view, basal and descending faces of propodeum meet in a continuous smooth curve..... **2**

2 Major: carinulae of frontal lobes confined to a narrow strip along their outer margins; profile of pronotum, viewed from above and obliquely, subangulate in its anterior half; propodeal spine lacking, replaced by an obtuse angle at the juncture of the basal and descending faces of the propodeum (Bolivia, Brazil, Argentina)..... ***gertrudae***

Major: carinulae cover most of the surface of the frontal lobes; profile of pronotum viewed from above and obliquely, smoothly rounded in its anterior half; small propodeal spines or denticles present (Brazil, Peru)..... ***capillata***

The *granulata* Group

This small assemblage of medium-sized to very large species is strictly western Nearctic in distribution, plus one member, *hecate,* present in Jamaica. Bound together by their 4-segmented antennal club, versus the 3-segmented state in all other *Pheidole,* they are heterogeneous in other characters and gathered together here only for taxonomic convenience. (In *dwyeri* the club is 3-segmented in the major, and 4-segmented in the minor.) One species *(granulata)* appears to be a derivative of the *fallax* group, another *(dwyeri)* is a good possibility for the same origin, while *clydei,* with a bidentate hypostoma in the major caste, likely originated within the *pilifera* group. One species known only from the minor caste, *grundmanni,* is problematic, and, finally, the Jamaican endemic *hecate,* which bears resemblance to *macromischoides* and closely similar species in Cuba, might well have originated from the Neotropical *tristis* group. The phylogeny will remain unknown until more material can be studied with cladistic and possibly also molecular analysis.

1 Major and minor: propodeal spine as long as the entire petiole; all of the mesosoma covered by prominent carinulae (Jamaica)..... ***hecate***

Major and minor (major unknown in *grundmanni*): propodeal spine at most two-thirds the length of the entire petiole; most of mesosoma devoid of carinulae..... **2**

2 A relatively gigantic species, with Head Width of major 2.6 mm and of minor 0.7 mm; head of major also huge relative to mesosoma, its width 2.6× that of the pronotum; major possesses an ocellus (Tres Marías Islands, Nayarit, Mexico)..... ***dwyeri***

Smaller species, Head Width of major 1.2–1.5 mm and of minor 0.5–0.6 mm; head of major modest in size relative to mesosoma, its width only about 2× that of pronotum; major lacks an ocellus (note again: major caste unknown in *grundmanni*)..... **3**

3 Major: scape exceeds occipital border; an extensive area between eye and frontal lobe is rugoreticulate; entire dorsal surface of body, including gaster, is foveolate and opaque. Minor: head strongly narrowed behind, with broad nuchal collar; all of dorsal surface of head and mesosoma foveolate and opaque (Baja California Sur, southern California)..... ***granulata***

Major (this caste unknown in *grundmanni* below): scape reaching only to the midpoint between eye and occipital corner; gaster smooth and shiny. Minor: occiput broad or narrow, but lacks occipital collar..... **4**

4 Minor: in full-face view, occiput narrow, less than two-thirds as broad as clypeus; side of pronotum foveolate and opaque (New Mexico to California)..... ***clydei***

Minor: in full-face view, occiput broad, more than three-fourths as wide as clypeus; side of pronotum smooth and shiny (montane Utah)..... ***grundmanni***

The *lamia* Group

This complex of species, whose majors are distinguished by small size, phragmotic heads, and reduced mesonotal convexity, appear to constitute a monophyletic group. Apparently related to the *flavens* group, they occur in the southern United States, Central America, and northern South America. They are everywhere reclusive, rare, or both.

1 Major: posterior half of the head capsule rugoreticulate; parallel transverse carinulae present on anterior half of pronotal dorsum (Texas) ..... ***pelor***

Major: posterior half of head capsule lacking rugoreticulum; pronotal dorsum lacking carinulae **2**

2 Major: head square-shaped, almost as broad as long; dense parallel longitudinal carinulae are present on frontal lobes but absent from posterior half of head capsule; transverse carinulae present on outer portions of clypeus (Colombia, Brazil) ..... ***colobopsis***

Major: head elongate, rectangular; sparse longitudinal carinulae either cover frontal lobes and posterior half of head or are entirely lacking; carinulae absent from clypeus **3**

3 Major: most of dorsal head surface covered by sparse parallel longitudinal carinulae; occiput and pronotum smooth and shiny (Florida to Texas) ..... ***lamia***

Major: dorsal head surface lacks carinulae, and instead is completely foveolate and opaque; pronotum also foveolate and opaque (Costa Rica) ..... ***truncula***

The *megacephala* Group

The single species of this African complex known from the New World, *megacephala,* is a tropicopolitan tramp globally spread by human commerce. In the New World, it occurs spottily in disturbed habitats from southern Florida throughout the West Indies to Mexico, Central America, and South America as far as southern Brazil. Its affinities will be unknown until the African *Pheidole* fauna is better analyzed. If I were handed specimens and told they belonged to a species native to the New World, I would be inclined on the basis of superficial appearance to place *megacephala* in the *tristis* group—except for its possession of only 2 hypostomal teeth, unique postpetiole shape, and unicolonial, polygynous colony structure. A good formula for recognizing *megacephala* at a glance is: heart-shaped head, circular mesonotum, oval postpetiole.

The *perpusilla* Group

This is a compact group of Neotropical species of exceptionally small size. Although their body forms and caste systems are typical of *Pheidole,* the species are unique within the genus in possessing only 10 antennal segments instead of 11 or the usual 12, hence their occasional formal recognition as a discrete subgenus, *Decapheidole*. In fact, they have the overall traits of the *flavens* group, and the reduction in antennal segment number is probably a derived condition correlated with their overall reduced size. Known from Panama to Trinidad and Amazonian Brazil and Peru, members of the *perpusilla* group are everywhere rare, or at least seldom collected.

1 Major: carinulae of dorsal surface of head extend at most over the anterior half of the head; forward half of the median strip of the first gastral tergite shagreened and opaque (Panama to Peru) ..... ***zeteki***

Major: carinulae cover all of the median half of the dorsal surface of the head, from the anterior edge of the frontal lobes to the occipital border; first gastral tergite smooth and shiny **2**

2 Major: region above (posterior to) the eye devoid of carinulae. Major and minor: propodeal spine in side view more than half as long as the basal face of the propodeum anterior to it (montane Ecuador) ..... ***globularia***

Major: region above (posterior to) the eye bears longitudinal carinulae. Major and minor: propodeal spine in side view one-fourth or less the length of the basal face of the propodeum anterior to it **3**

3 Major: mesosoma entirely smooth and shiny; in side view, profile of promesonotal dorsum forming a near-perfect arc of a circle; hairs of first gastral tergite sparse, as short as the propodeal spiracle is long, and mostly subappressed. Minor: entire body smooth and shiny, and its dorsal surface profile almost completely devoid of pilosity (Amazonian Peru) ..... ***gemmula***

Major: mesosoma entirely foveolate and opaque; profile of promesonotal dorsum flattened into a low convexity at its center; hairs of first gastral tergite abundant, much longer than the propodeal spiracle, and mostly suberect to erect. Minor: all of dorsal surface of head and mesonotum foveolate and opaque, and all of dorsal surface profile of body with abundant pilosity (Panama to Amazonian Brazil) ..... ***perpusilla***

The *pilifera* Group

The principal distinguishing feature of this almost exclusively Nearctic assemblage is the possession by the major caste of 0–3 hypostomal teeth, instead of the usual (but not invariable) 4–5 found in other species groups. To this may be added the typically quadrate head shape of both major and minor, as well as their short scapes. Furthermore, the minor of most of the species has proportionally large eyes (the ratio of Eye Length to Head Length among the species ranges from 0.14 to 0.40, with the majority falling in 0.20–0.25, well above the average for other groups). All together these traits allow *pilifera*-group species to be separated at a glance from unrelated species that also possess 2 or 3 hypostomal teeth, including some members of the Neotropical *biconstricta* group; *eidmanni, gigas, laevivertex,* and *puttemansi* of the *fallax* group: *nebulosa, oaxacana,* and *scabriventris* of the *flavens* group; *capillata* and *gertrudae* of the *gertrudae* group; *clydei* of the *granulata* group; and *fabricator, pidax,* and *polita* of the *tristis* group; as well as the African tramp species *megacephala*. The *pilifera*-group species are otherwise most similar in the totality of their major and minor traits to members of the *flavens* group.

1 Major: occiput covered partly or entirely by carinulae, rugulae, or a rugoreticulum **2**

Major: occiput smooth and shiny, or sparsely foveate, or densely foveolate, but not bearing carinulae, rugulae, or a rugoreticulum **24**

2 Major: rear of head phragmotic, i.e., occiput strongly concave and rugoreticulate, creating an armored surface (Sinaloa, Mexico) ..... ***setsukoae***

Major: rear of head not phragmotic; occiput convex and variously sculptured **3**

3 Major: all or almost all of the dorsal surface of the head carinulate, rugose, foveolate, or combinations thereof **4**

Major: a large portion of the dorsal surface of the head just anterior to the occiput, and including at least a third of the head capsule, smooth and shiny **15**

4 A trimorphic species, with heads of both the major and supermajor, including occiput, completely covered with parallel longitudinal carinulae. Very large (Head Width of major 2.5 mm, of supermajor 3.9 mm, and of minor 0.9 mm). Major and minor: propodeal spine in side view exceeding three-fourths the length of the basal face of the propodeum anterior to it (southern Arizona, northern Mexico) ..... ***rhea***

Major: dimorphic, or, if trimorphic, dorsum of head of major partly bare (part of frontal lobes and area behind frontal lobes in *hirtula* and *obtusospinosa,* most of posterior half of head dorsum in *tepicana,* and clypeus in all three species); smaller than *rhea,* with Head Width of major 1.0–1.6 mm and of minor 0.5–0.6 mm. Major and minor: propodeal spine in side view only half the length of the basal face of the propodeum anterior to it **5**

5 Major: in side view head "dented"—its profile strongly concave just anterior to the occipital border (southern Texas) ..... ***hoplitica***

Major: in side view, profile smoothly convex, or straight, or at most very weakly concave just anterior to the occipital border **6**

6 Major: occiput completely and coarsely rugoreticulate. Minor: posterior half of dorsum of head completely covered by carinulae (Arizona)..... ***cavigenis***

Major: occiput transversely carinulate or rugulose, lacking rugoreticulum. Minor: posterior half of head foveolate or smooth, not carinulate..... **7**

7 Major: most of the side of the head mesad and posterior to the eye all the way to the occiput is rugoreticulate..... **8**

Major: side of head mesad and posterior to the eye is smooth or longitudinally carinulate..... **9**

8 Major: smaller (Head Width about 0.90 mm) but with larger eyes (Eye Length about 0.18 mm); medium yellow (some populations of *californica,* a widespread species of the western U. S.)..... ***californica* (in part)**

Major: larger (Head Width about 1.10 mm) but with smaller eyes (Eye Length about 0.14 mm); dark yellow (San Clemente Island, mainland California, and Baja California)..... ***clementensis***

9(7) A trimorphic species. Major: all of rear half of dorsal surface of head except occiput smooth and shiny. Supermajor: all of rear half of dorsal surface of head carinulate and rugulose. Minor: lower half of mesopleuron and most of the side of propodeum smooth and shiny (Texas and Arizona to central Mexico)..... ***tepicana* (in part)**

Dimorphic or trimorphic species. Major: rear half of dorsal surface of head carinulate or rugulose (in supermajor, if present, most of rear half of dorsal surface lacks carinulae or rugulae)..... **10**

10 Major: sides of head posterior to and laterad to the eye mostly or entirely smooth and shiny. Minor: head and pronotum entirely foveolate and opaque..... **11**

Major: sides of head posterior and laterad to eye foveolate and opaque, or longitudinally carinulate, or both. Minor: head and pronotum entirely smooth and shiny..... **12**

11 Major: in side view, mesonotal convexity well developed, with a front face and descending to metanotal groove in a smooth curve; center of metanotum foveolate and opaque, with irregular, broken carinulae. Minor: longitudinal carinulae present laterad to eye (eastern U. S. populations of *pilifera*)..... ***pilifera* (in part)**

Major: in side view, mesonotal convexity absent; the promesonotum as a whole presents a continuous profile that descends to the metanotal groove in a steep posterior face. Minor: carinulae absent laterad to the eye (Chihuahua, Mexico)..... ***torosa***

12(10) Trimorphic species, with occiput of major longitudinally carinulate..... **13**

Dimorphic species, with occiput of major transversely carinulate..... **14**

13 Occiput of supermajor in full-face view sparsely covered by round foveae, with interspaces smooth and shiny (upland central Mexico)..... ***hirtula* (in part)**

Occiput of supermajor in full-face view sparsely covered by elongate foveae, with interspaces densely foveolate and opaque (montane southern Arizona, western Mexico)..... ***obtusospinosa* (in part)**

14(12) Major: center of promesonotal dorsum smooth and shiny. Minor: hairs on dorsa of mesosoma and petiole ordinary, not clavate. Major and minor: yellow (Arizona, southern California) ..... ***micula***

Major: center of promesonotum foveolate and opaque. Minor: most of the hairs on the dorsa of mesosoma clavate. Major and minor: light brown (Mississippi to southwestern U. S. and northern Mexico) ..... ***soritis***

15(3) Major: all of side of pronotum and upper half of sides of mesopleuron and propodeum covered by longitudinal carinulae; summit of petiolar node in side view acute-angular; seen from above, petiolar node drawn laterally into sharp points. Minor: posterior half of head carinulate (Colorado, New Mexico, Arizona) ..... ***senex***

Major: areas of body listed above lacking carinulae; summit of petiolar node in side view rounded; seen from above, the sides of the petiolar node either rounded or angular. Minor: posterior half of head not carinulate **16**

16 Major and minor: promesonotal profile seen from dorsal-oblique view (mesosoma rotated around long axis for 45 degrees from top view), with 3 convexities, 2 pronotal and a single mesonotal one, with the central convexity (second pronotal) being by far the highest. Minor: in full-face view, the occipital margin deeply concave, the two halves meeting to form an angle at midline; the eye enormous, as long as the entire petiole (Baja California Sur) ..... ***bajaensis***

Major and minor: promesonotal profile seen from dorsal-oblique view, with one or 2 convexities, or if 3, the central convexity is only about as high as the first convexity. Minor: in full face view the occipital margin variable, usually only shallowly concave and not forming an angle at midline; eye shorter than petiole **17**

17 Major: seen from dorsal-oblique view, pronotum is drawn out into a large, equilaterally triangular lobe that projects far above the level of the mesonotal convexity (central Mexico) **18**

Major: seen from dorsal-oblique view, the pronotum is not extended as a large triangular lobe; instead the promesonotal border forms a single, continuous convexity only slightly higher than the level of the mesonotal convexity **19**

18 A trimorphic species, with major, supermajor, and minor castes. Major: postpetiolar node seen from above drawn laterally into blunt right angles. Minor: entire dorsum of pronotum foveolate and punctate; carinulae of frontal lobes extend posteriorly beyond level of eye ..... ***polymorpha***

Dimorphic so far as known (from small type series) but supermajor may exist. Major: postpetiolar node tapered laterally to form points. Minor: dorsum of pronotum smooth and shiny ..... ***calens***

19(17) Major: seen from the side, profile of posterior half of dorsum of head flat to very slightly concave; mesonotum partly to wholly foveolate, anterior fringe of first gastral tergite shagreened. Minor: posterior half of dorsal surface of head partly or entirely foveolate (western populations of *pilifera*) ..... ***pilifera*** **(in part)**

Major: seen from the side, posterior half of dorsum of head weakly to moderately convex; mesonotum entirely smooth and shiny; all of first gastral tergite smooth and shiny. Minor: posterior half of dorsal surface of head entirely smooth and shiny **20**

20 Minor (note, not major): dorsal margin of petiolar node, seen from the rear, concave. The following traits are typical but not certainly diagnostic. Major: viewed from the side, occiput flattened, its profile only very weakly convex and its width from front to back over 1.5× the width of the anterior margin of the side of the head; seen from above, sides of postpetiolar node drawn into acute angles; in full-face view, occipital lobes subangular, their inner margins running mesad to the midline of the head in nearly straight lines. Minor: seen from above, postpetiolar node trapezoidal in shape (Oregon, Nevada, northern California)..... ***creightoni***

Minor (note, not major): dorsal margin of petiolar node, seen from the rear, straight or convex. The following traits are typical but not certainly diagnostic. Major: viewed from side, occiput strongly convex, its width from front to back only about as great as the width of the anterior margin of head; seen from above, postpetiolar node oval in shape, with rounded or subangular lateral margins; in full-face view, occipital lobes arc-shaped, their inner margins running mesad to the midline of the head in convex lines. Minor: seen from above, postpetiolar node circular or oval in outline **21**

21 Major: no longitudinal carinulae occur directly posterior to the frontal triangle, and no carinulae at all extend posteriorly beyond the eye for a distance as great as the length of the eye. Minor: dorsal margin of pronotum seen in profile lined by a small number of spatulate hairs. Major and minor: medium yellow (southern Texas) ..... ***aurea***

Major: longitudinal carinulae occur behind the frontal triangle; and carinulae mesad to the eye extend past the eye for a distance equal to the length of the eye or more. Minor: hairs on pronotal dorsum are tapered or blunt-tipped, not spatulate. Major and minor: brownish to reddish yellow or light brown **22**

22 Trimorphic, with minor, major, and supermajor. Major: carinulae originating from directly behind the frontal triangle reach less than halfway to the occipital border. Minor: eye only as long as its distance to anterior border of head..... ***tepicana*** **(in part)**

Dimorphic, with minor and major only. Major: carinulae originating from directly behind the frontal triangle reach three-fourths of the way to the occipital border. Minor: eye longer than its distance to anterior border of head..... **23**

23 Major: pronotum foveolate and opaque, with transverse carinulae present in addition on the anterior quarter of its dorsum. Major light reddish brown, minor yellowish brown (Texas to Arizona)..... ***rugulosa***

Major: pronotum completely smooth and shiny, with no carinulae. Major and minor: yellow (some populations of *californica,* found from northern California north to Washington and east to Nevada) (also, check against *clementensis,* especially with reference to size, Eye Length, and color)..... ***californica*** **(in part)**

24(1) Major and minor: propodeal spine absent; in side view basal and descending faces run together as an unbroken convexity or obtuse angle. Minor: head with psammophore, comprising hairs on the ventral surface of the head more than 2× longer than most on the dorsal surface of the head, plus clypeal hairs that extend anteriorly well beyond the closed mandibles (Arizona to southern California)..... ***barbata***

Major and minor: propodeal spine present, at least as a right-angular projection; psammophore and elongated clypeal hairs present or not..... **25**

25 Major: in side view, lower margin of postpetiole bears a prominent toothlike or right-angular projection..... **26**

Major: in side view, lower margin of postpetiole straight or slightly convex, lacking a toothlike or angular projection..... **28**

26 Major: subpostpetiolar projection right-angular; occiput covered with scattered conspicuous foveae, and rest of dorsum of head anterior to the occiput longitudinally carinulate; promesonotum partly covered by rugoreticulum (Florida) ..... ***littoralis***

Major: postpetiolar projection acute, toothlike; occiput, rest of dorsum of head posterior to level of eyes, and promesonotum smooth and shiny **27**

27 Very large species (Head Width of major 2.7 mm, of minor 0.8 mm). Major: postpetiolar node with prominent transverse carina across its middle, and with angulate corners. Minor: in side view, peduncle of petiole anterior to the node of typical length, i.e., only about as long as the postpetiole, and with a well-developed node (Arizona, New Mexico) ..... ***militicida***

Medium-sized species (Head Width of major 1.6 mm, of minor 0.5 mm); postpetiole oval, and lacking a transverse carina. Minor: in side view, petiole extremely long and thin, its peduncle twice the length of the postpetiole and with a flattened, barely discernible node (southern California, Arizona, northern Mexico) ..... ***psammophila***

28(25) Major: space between eye and antennal fossa rugoreticulate **29**

Major: space between eye and antennal fossa longitudinally carinulate only (supermajor, if present, rugoreticulate in this space) **31**

29 Major: occiput mostly smooth and shiny; first gastral tergite entirely smooth and shiny. Minor: propodeal spine reduced to denticle (Mexico City) ..... ***azteca***

Major: occiput and anterior half of first gastral tergite foveolate and opaque. Minor: propodeal spine strongly developed **30**

30 Major: carinulae just mesad to eye extend beyond eye less than the length of the eye. Minor: in side view, propodeal spine longer than the basal face anterior to it (Oaxaca, Mexico) (placed in the *flavens* group; also keyed out here to ensure identification) ..... ***oaxacana***

Major: carinulae just mesad to eye extends beyond eye by 3× length of eye or more. Minor: in side view, propodeal spine only about one-fourth the length of the basal face of the propodeum anterior to it (Veracruz, Mexico) (placed in the *flavens* group; also keyed out here to ensure identification) ..... ***scabriventris***

31(28) Major: entire side of mesosoma (pronotum, mesopleuron, and propodeum) covered by parallel longitudinal carinulae **32**

Major: at least the mesopleuron and usually most of the rest of the side of the pronotum free of carinulae **33**

32 Major: pronotal dorsum covered by transverse carinulae and mesonotal dorsum by longitudinal carinulae on a surface made opaque by foveolae; hypostoma with 3 teeth. Minor: pronotum foveolate and opaque (east-central U. S., northeastern Mexico) ..... ***davisi***

Major: promesonotal dorsum smooth and shiny; hypostoma lacking teeth completely. Minor: pronotum smooth and shiny (Florida) ..... ***adrianoi***

33(31) Major: occiput covered by widely spaced, conspicuous foveae **34**

Major: occiput lacking a field of conspicuous foveae **35**

34 Major and minor: propodeal spines reduced to protruding right angles (Yucatán, Mexico) ..... ***yucatana***

Major and minor: propodeal spines well developed, with acute-angular apices (Baja California) ..... ***macrops*** **(in part)**

35(33) Major: pronotal dorsum covered by transverse carinulae or rugulae **36**

Major: pronotal dorsum possessing at most one or 2 patches of carinulae **38**

36 Major: mesonotum covered by longitudinal carinulae; many of the carinulae of the frontal lobes attain the occipital border; in dorsal-oblique view, profile of humerus subangulate and most of profile of promesonotum posterior to it flat (northern Florida) ..... ***carrolli***

Major: mesonotum with at most several transverse carinulae; carinulae of frontal lobes fail to reach occipital border; in dorsal-oblique view, profile of humerus and rest of promesonotum convex **37**

37 Major: large, Head Width about 2.0 mm. Minor: dorsal surface of head completely covered by carinulae; Eye Length much smaller than distance from eye to anterior border of head (Texas, Arizona) ..... ***virago***

Major: smaller, Head Width about 1.3 mm. Minor: dorsal surface of head mostly free of carinulae; eye very large, Eye Length much greater than distance from eye to anterior border of head ("subsp. *tucsonica*" of *xerophila,* a widespread species in southwestern U. S., California, and Sonora, Mexico) ..... ***xerophila* (in part)**

38(35) Major: in full-face view, tip of scape touched to margin of head is 0.4× or more the distance from level of posterior margin of eye to level of occiput **39**

Major: in full-face view, tip of scape touched to margin of head is less than 0.4× the distance from level of posterior margin of eye to level of occiput **43**

39 Dimorphic species, with major and minor castes only. Major: in full-face view, posterior third of dorsum of head foveolate or smooth, lacking longitudinal carinulae **40**

Trimorphic species, with major, supermajor, and minor. Major: in full-face view, posterior third of head completely covered by parallel longitudinal carinulae **42**

40 Major: in side view, mesonotal convexity well developed, with a distinct anterior face separating it from the pronotal profile in front and a distinct posterior face separating it from the metanotal groove to the rear; head brownish yellow anterior to the eyes and reddish brown behind (Texas to Arizona, northern Mexico) (placed in the *fallax* group; also keyed out here to ensure identification) ..... ***sciophila***

Major: in side view, mesonotal convexity absent, with promesonotal profile forming a single semicircular curve; head concolorous yellow or tricolored, with dark band across the middle of the head **41**

41 Major: dorsal surface of head concolorous yellow; pilosity very sparse, with about a dozen hairs fringing the dorsal profile of the head capsule and only several fringing the entire mesosomal profile (Guatemala) ..... ***defecta***

Major: head colored to create a unique "mask," with the dorsal surface of the occipital lobes and the genae yellow and the rest of the dorsal surface of the head brown; abundant hairs line the dorsal profiles of the head capsule and mesosoma (Costa Rica) (placed in the *flavens* group; also keyed out here to ensure identification) ..... ***nasutoides***

42(39) Supermajor: foveae on posterior third of head, including occiput, longitudinally elongate (mountains of southern Arizona and western Mexico) (formerly *"subdentata"*) ..... ***obtusospinosa* (in part)**

Supermajor: foveae on posterior third of head, including occiput, circular in shape (high plateaus and mountains of eastern and central Mexico) ..... ***hirtula* (in part)**

43(38) Major: side of petiole with longitudinal carinulae; dorsum of postpetiolar node foveolate, opaque, and transversely carinulate. A large (Head Width of major 1.9 mm, of minor 0.9 mm), reddish brown species (Texas, Arizona, western Mexico) ..... ***titanis***

Major: petiole and postpetiole lacking carinulae; dorsum of postpetiolar node smooth and shining. Size variable, but usually much smaller, color variable **44**

44 Combining the following two traits: first, in major, longitudinal carinulae of frontal lobes do not extend posteriorly past level of posterior margin of eye, and, second, in side view the promesonotal profile of the major and minor forms a near-perfect semicircle, without any trace of a separate mesonotal convexity **45**

Either the longitudinal carinulae of the frontal lobes of the major extend posteriorly beyond the level of the posterior margin of the eye by a distance at least as great as the length of the eye, or else the promesonotal profile of the major and minor is irregular, usually with a discernible mesonotal convexity or a sharp drop of the mesonotum posteriorly to the metanotal groove, or both **48**

45 Major: almost all of the sides of the pronotum lined with curving longitudinal carinulae (southern Arizona, California) ..... ***gilvescens* (in part)**

Major: at most, the lower anterior part of the sides of the pronotum lined with several longitudinal carinulae **46**

46 Major: seen from above, lateral margins of postpetiolar node drawn into sharp, hornlike angles; seen in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view), humerus protrudes as an obtuse angle. Minor: seen from above and obliquely, humerus of minor surmounted by a low denticle. Reddish brown; in addition, major has a circular dark brown spot in center of dorsum of the head capsule (Texas, northern Mexico) ..... ***pinealis***

Major: seen from above, postpetiolar node oval or trapezoidal in shape; seen in dorsal-oblique view, humerus of major and minor smoothly convex. Yellow; major lacks a spot on center of head capsule 47

47 Major: postpetiolar node viewed from above trapezoidal; pronotum lacking carinulae; propodeal spine viewed from the side only about as long as propodeal spiracle. Minor: eye much longer than the distance from its anterior border to the genal border (Nevada, southern California) ..... ***paiute* (in part)**

Major: postpetiolar node viewed from above oval; propodeal spine viewed from the side 3× longer than the propodeal spiracle is wide. Minor: eye only about as long as the distance from its anterior border to the genal border (montane Chiapas, Mexico) ..... ***agricola***

48(44) Major: lateral margins of postpetiolar node drawn out into sharp spines; postpetiolar node 2× as wide as petiolar node **49**

Major: postpetiolar node oval, semicircular, conulate, or acute-angular, not spinose, and less than 2× as wide as petiolar node **50**

49 Major: in side view, petiolar node is pointed at summit; sides of propodeum, petiole, and postpetiole smooth and shiny. Large size (Head Width of major 1.7 mm, of minor 0.5 mm) (southern Arizona, northern Mexico) ..... ***spadonia***

Major: in side view, petiole is rounded at summit; sides of propodeum, petiole, and postpetiole foveolate and opaque. A smaller species (Head Width of major 1.1 mm, of minor 0.5 mm) (southwestern U. S., California, northern Mexico) ..... ***cerebrosior***

50(48) Major: seen in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view), humerus swollen into a blunt tooth or prominent lobe that rises in outline well above the posterior contour of the rest of the pronotum **51**

Major: seen in dorsal-oblique view, profile of humerus does not rise high above the posterior profile of the rest of the pronotum but forms a more or less even line with it **53**

51 Trimorphic species, with major, supermajor, and minor castes. Major: postpetiolar node, viewed from above, forming a half-circle in outline, with broad side of the semicircle at the posterior margin; lower half of mesopleuron smooth and shiny. Minor: head in full-face view square-shaped, about as wide as long; in side view postpetiolar node very low, its summit profile a feeble convexity (southern Texas, Arizona) ..... ***macclendoni***

Dimorphic or trimorphic species. Major: postpetiolar node viewed from above centrally oval in outline and with angulate or subangulate sides; lower half of mesopleuron either smooth and shiny or foveolate and opaque. Minor: head in full-face view rectangular, distinctly longer than wide; in side view, postpetiolar node well developed, its summit profile forming a strong convexity **52**

52 Trimorphic species, with major, supermajor, and minor castes. Major: no longitudinal carinae arising from directly behind the frontal triangle, and thus there is a gap along the midline of the head between the carinulae arising on either side from the frontal lobes. Minor: seen from above and obliquely, the humerus lacks any protrusion, so that the promesonotal profile forms a single smoothly curving line (central and southern Mexico) ..... ***centeotl***

Dimorphic species, supermajor lacking. Major: longitudinal carinulae arise from behind the frontal triangle and continue along the midline of the head to more than halfway between the level of the posterior margin of the eye and the occipital border. Minor: seen from above and obliquely, the profile of humerus is broken by a distinct denticle or lobe (cold temperate U. S., New York to California) ..... ***bicarinata***

53(50) Major: most of the longitudinal carinulae on the frontal lobes extend beyond the level of the eyes to at least midway between the level of the posterior margin of the eyes and the occipital margin; blackish brown, with contrasting brownish yellow clypeus. Minor: blackish brown, including clypeus (mountains, Colorado to Texas and Arizona) ..... ***ceres***

Major: longitudinal carinulae of frontal lobes extend beyond the eyes by less than the length of the eyes, or not at all, although several carinulae in between, along the midline of the head, may extend farther; color among species varies from yellow to blackish brown **54**

54 Major: several carinulae originating from behind the frontal triangle extend along the dorsal midline of the head all the way to the occiput. A very small species (Head Width of major 0.9 mm, of minor 0.4 mm), yellow in color. Minor: in side view, pilosity along dorsal profile of promesonotum consists of 4 evenly spaced pairs of clavate hairs (Texas) ..... ***marcidula***

Major: carinulae originating from above the frontal triangle extend along midline of head at most halfway between eyes and occiput. Larger species (Head Width of major 1.1–1.3 mm, of minor 0.5–0.6 mm), of various colors. Minor: pilosity on dorsal promesonotal profile not arrayed in evenly spaced pairs, and not clavate **55**

55 Major: pronotum completely lacks transverse carinulae; several carinulae originating behind frontal triangle extend along midline of dorsum of head to midway between the level of the posterior margin of the eyes and the occipital border; posterior half of the dorsum of the head bearing widely spaced, conspicuous foveae (Baja California)..... ***macrops* (in part)**

Major: pronotum bears transverse carinulae on its anterior half; carinulae originating behind frontal triangle extend only slightly beyond the level of the posterior margins of the eyes; posterior margin of the dorsum of the head lacking foveae **56**

56 Major: in side view, posterior half of dorsal profile of head is smoothly convex, and entire head is not tapered from mid-level to the occiput **57**

Major: in side view, posterior half of dorsal profile of head is flat or nearly so, and entire head tapers in side view from mid-level to the occiput..... **58**

57 Major: larger, Head Width about 1.20 mm. Minor: eye proportionately much larger, with Head Width about 0.50 mm and Eye Length 0.16 mm (southern California, Baja California)..... ***yaqui***

Major: smaller, Head Width about 1.04 mm. Minor: eye proportionately smaller, with Head Width about 0.5 mm and Eye Length 0.12 mm (Nevada, southern California) ..... ***paiute* (in part)**

58(56) Major: yellow; postpetiolar node seen from above transversely oval in shape, only about a third wider than the petiolar node; sides of pronotum carinulate. Minor: yellow (southern Arizona to California) ..... ***gilvescens* (in part)**

Major: reddish brown; postpetiolar node transversely conulate, nearly 2× wider than the petiolar node; sides of pronotum mostly smooth. Minor: yellowish brown. ("Typical form" of *xerophila,* a widespread species in southwestern U. S., California, and Sonora, Mexico) ..... ***xerophila* (in part)**

The *punctatissima* Group

This is a congeries of small, slender species with abundant cephalic sculpturing, relatively long antennal scapes, and typically large-eyed minors, that range from southern Mexico to northern and central South America. The greatest species diversity is in Central America. The affinities of the *punctatissima* group cannot be readily determined with existing evidence. It appears to fall roughly between the *diligens, fallax,* and *flavens* groups.

1 Occipital lobes rugoreticulate **2**

Occipital lobes among species variously rugose, carinulate, foveolate, and smooth and shiny but not rugoreticulate **3**

2 Major: propodeal spine reduced to a right angle; scape reaches occipital corner; ocellus present; brown (montane Peru) ..... ***inca***

Major: propodeal spine well developed, in side view half as long as the basal face of the propodeum anterior to it; scape failing to reach the occipital corner by 2× its own maximum width; ocellus lacking; yellow (Veracruz, Mexico) ..... ***tuxtlasana***

3(1) Major: in side view, no trace of mesonotal convexities present; instead, the promesonotal profile forms a smooth curve all the way back to the metanotal groove or else drops to it abruptly through a posterior face **4**

Major: in side view, a mesonotal convexity is present, even though reduced in some species to a slight rise above the level of the pronotal profile **6**

4 Major: in side view, promesonotal profile forms a continuous smooth curve all the way to the metanotal groove (Costa Rica) (placed in the *flavens* group; also keyed out here to ensure identification) ..... ***onyx***

Major: in side view, promesonotal profile drops abruptly through a distinct posterior face to the metanotal groove **5**

5 Major: in side view, the propodeal spine is "melted"— blunt at the tip and curved backward; first gastral tergite smooth and shiny (Costa Rica) (placed in the *flavens* group; also keyed out here to ensure identification) ..... ***citrina***

Major: in side view, the propodeal spine is sharp and straight; median half of first gastral tergite shagreened and opaque (Costa Rica) ..... ***gradifer***

6(3) Major: in full-face view, head strongly heart-shaped, and yellow with a circular brown spot on the vertex; when tips of scapes are touched to the margin of the head in full face, they fail to reach halfway between the horizontal levels of the posterior margin of the eye and of the occipital lobes (Costa Rica) (placed in the *flavens* group; also keyed out here to ensure identification) ..... ***daphne***

Major: in full-face view, head usually not heart-shaped, and never yellow with a brown spot on the vertex; tips of scapes reaching the midpoint between horizontal levels of eye and occipital lobes or beyond **7**

7 Major: propodeal spine in side view reduced to a minute denticle or right angle formed by the juncture of the basal and descending faces of the propodeum **8**

Major: propodeal spine in side view well developed **9**

8 Major: occiput and pronotum smooth and shiny (tropical South America) (placed in the *diligens* group; also keyed out here to ensure identification) ..... ***cataractae***

Major: pronotum foveolate, occiput seen in full face longitudinally carinulate as well as foveolate, and both opaque (Costa Rica to Brazil and Peru) ..... ***rugiceps* (in part)**

9(7) Major: pronotum and occiput smooth and shiny (Costa Rica) ..... ***humida***

Major: pronotum foveolate, and occiput in full-face view either longitudinally carinulate, foveolate, or both; pronotum and occiput also opaque **10**

10 Major: seen in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view), the pronotal humerus is raised into a prominent cornicle; head strikingly bicolored, with anterior third brown and posterior two-thirds pale yellow (Mexico to Colombia) ..... ***punctatissima***

Major: seen in dorsal-oblique view, the pronotal humerus evenly convex to subangular and not raised as a discrete cornicle; head concolorous, either yellow or brown, or bicolorous, with anterior third yellow **11**

11 In side view, propodeal spines as long as the basal face of the propodeum anterior to them (Colombia) ..... ***cataphracta***

In side view pronotal spines at most half as long as the basal face of the propodeum anterior to them **12**

12 Major: carinulae or rugoreticulum immediately mesad to eye not extending past the horizontal level of the posterior eye margin by more than the length of the eye **13**

Major: carinulae or rugoreticulum immediately mesad to the eye extending half or more of the way from the horizontal level of the posterior eye margin to the occiput **15**

13 Major: almost all of anterior half of head, including clypeus, rugoreticulate (Tamaulipas, Mexico) (placed in the *fallax* group; also keyed out here to ensure identification) ..... ***cielana***

Major: anterior half of head lacking rugoreticulum **14**

14 Major: seen in profile, pilosity of first gastral tergite consisting of dense, subappressed hairs less than half as long as the length of the eye. Minor: head rectangular in shape, elongate (Head Length 1.30× Head Width), and lacking a nuchal collar; clavate hairs not present on occiput and mesosomal dorsum; central strip of first gastral tergite entirely foveolate and opaque (Costa Rica) ..... ***angusticeps***

Major: seen in profile, pilosity of first gastral tergite consisting of scattered suberect hairs longer than the eye. Minor: head not elongate (Head Length only 1.14× Head Width), and narrowed behind with a nuchal collar; a few clavate hairs present along with the usual, non-clavate pilosity on the occiput and mesosomal dorsum; first gastral tergite entirely smooth and shiny (Guyana to Brazil and Peru) ..... ***meinerti***

15(12) Major: entire body densely pilose, and in particular profiles of dorsum of mesosoma (thorax plus propodeum) and of head each with 30 or more hairs; pronotum bearing parallel transverse carinulae or rugoreticulum. Minor: nuchal collar present (Panama) ..... ***dasypyx***

Major: body only sparsely to moderately pilose, with fewer than 20 hairs each on the mesosomal and cephalic profiles; pronotum lacking transverse carinulae. Minor: nuchal collar absent **16**

16 Major: frontal lobes and pronotal dorsum rugoreticulate (Tamaulipas, Mexico) (placed in the *fallax* group; also keyed out here to ensure identification) ..... ***nubicola***

Major: frontal lobes and pronotal dorsum carinulate or foveolate, not rugoreticulate **17**

17 Major: in side view, outline of pronotum forming a double convexity; profile of dorsum of head in side view "dented"—with a shallow concavity just anterior to occiput; a thin anterior portion of the central half of the first gastral tergite shagreened and opaque. Minor: pronotum in profile with a slight double convexity (Trinidad) ..... ***aripoensis***

Major: in side view, outline of pronotum composing a single convexity; profile of dorsum of head not "dented" anterior to occiput; first gastral tergite entirely smooth and shiny. Minor: pronotal profile composing a single convexity **18**

18 Major: dorsum of head, from clypeus to occiput, completely covered by well demarcated parallel longitudinal carinulae; propodeal spine small, in side view only about as long as width of the propodeal spiracle. Minor: propodeal spine a triangular denticle only about as long as width of propodeal spiracle (Costa Rica to Brazil and Peru) ..... ***rugiceps*** **(in part)**

Major: longitudinal carinulae on dorsum of head posterior to eye broken into fragments and indistinct; propodeal spine twice as long in side view as width of the spiracle. Minor: propodeal spine well developed, longer than width of propodeal spiracle (Meta, Colombia) ..... ***metana***

The *scrobifera* Group

Big (in most cases), hairy, scrobe-headed, and heavily sculptured: such is a serviceable capsule description of the *scrobifera*-group major caste. The center of species diversity is tropical Mexico and Central America, with one representative each known from Cuba and Ecuador. The origin of the group is problematic, but a fair guess at this time, based on the general body form of the minor caste, is that the *scrobifera* group arose from somewhere within the large Neotropical *tristis* group or from a common ancestor. Two species, *epetrion* and *thrasys,* are known from minors only, and should be checked directly from the drawings. When majors are available, *epetrion* and *thrasys* are likely to key out to *arctos* or *simonsi*.

1 Major: in full-face view almost all of the dorsal surface of the head covered by a single carinulate shield that includes the frontal lobes; the frontal lobes in full-face view expanded laterally to touch the eyes and anteriorly to cover most of the lateral wings of the clypeus; head completely covered by extremely long hairs, some of which are more than half as long as the antennal scape (southern Mexico, Guatemala) ..... ***tisiphone***

Major: in full-face view, the frontal lobes neither reach the eyes nor cover the lateral wings of the clypeus; hairs on head much shorter than half the length of the antennal scape..... **2**

2 Major: in full-face view, occiput smooth and shiny, in contrast with rest of head capsule, which (exclusive of center of the clypeus) is entirely rugoreticulate; in side view, most of dorsal profile of the head, from the anterior clypeal border to the level of the posterior margin of the antennal scrobe, bears a dense row of very short, perfectly erect hairs, all approximately equal in height—like the teeth of a comb. Minor: almost entire dorsal surface of head posterior to the clypeus rugoreticulate (Ecuador)..... ***peckorum***

Major: occiput in full-face view rugoreticulate or longitudinally carinulate; in side view, a dense row of hairs as described above absent or at most limited to the posterior third of the head surface. Minor: rugoreticulum absent from dorsal surface of head or, if present, limited to the occiput..... **3**

3 Major: in full-face view, occiput covered by parallel longitudinal carinulae (Amazonian Brazil and Peru) ..... ***mamore***

Major: in full-face view, occiput covered by rugoreticulum **4**

4 Major: entire dorsum of promesonotum rugoreticulate; profile of head, in side view, strongly "dented"—with a deep concavity, just anterior to the occiput. Minor: entire dorsum of promesonotum rugoreticulate (Honduras) ..... ***wardi***

Major: at most, only the humeri are rugoreticulate; profile of head just anterior to occiput convex, or straight, or at most very feebly concave. Minor: pronotum smooth and shiny, transversely carinulate..... **5**

5 Major: pronotal dorsum lacking carinulae or rugoreticulum (Costa Rica)..... **6**

Major: pronotal dorsum mostly covered with carinulae, with or without some rugoreticulum **7**

6 Major: frontal lobes and pronotal dorsum entirely smooth and shiny; in side view, profile of head and mesosoma fringed by dense layer of erect to suberect hairs as long as the eye or longer. Minor: pronotum and dorsal surface of head smooth and shiny; occiput with posterior nuchal collar (Costa Rica)..... ***vestita***

Major: frontal lobes covered by parallel longitudinal carinulae; pronotal dorsum foveolate and opaque; in side view, profile of head and mesosoma fringed by erect to subrecumbent hairs mostly less than half the length of the eye. Minor: pronotum and dorsal surface of head foveolate and opaque; nuchal collar absent (Costa Rica)..... ***scrobifera***

7(5) Major: in full-face view, entire dorsum of head capsule, including central third, covered by carinulae or rugoreticulum. Minor: head and pronotum completely foveolate and opaque; pronotal dorsum is transversely carinulate; scape exceeds occipital corner by at least 5× its own maximum width (Cuba)..... ***cubaensis***

Major: in full-face view, central third of head capsule devoid of carinulae and rugoreticulum, covered with foveolae only. Minor: head and pronotum entirely smooth and shiny; scape exceeds occipital corner by much less than 5× its own length..... **8**

8 Major: most of space between eye and anterior half of frontal lobe rugoreticulate; in full-face view, rugoreticulum at margins of head extends from occiput anteriorly all the way to the antennal scrobes (Tamaulipas, Mexico) (Two species, *epetrion* and *thrasys,* known only from the minors, are likely to key out here also; check the drawings and diagnoses.)..... ***arctos***

Major: space between eye and anterior half of lobe lacks rugoreticulum; in full-face view, rugoreticulum at margins of head fails to extend anteriorly all the way to the antennal scrobes..... **9**

9 Major: rugoreticulum present mesad to posterior fifth of antennal scrobe; anterior edge of central third of first gastral tergite longitudinally striate; postpetiolar dorsum with at most several feeble longitudinal carinulae (Veracruz, Mexico)..... ***gangamon***

Major: no rugoreticulum present mesad to posterior fifth of antennal scrobe; anterior edge of central third of first gastral tergite foveolate but not striate; postpetiolar dorsum rugoreticulate (Costa Rica)..... ***simonsi***

The *tachigaliae* Group

These tiny ants, distinguished by antennal segmentation reduced from 12 to 11, as well as by the possession of antennal scrobes and heavy cephalic sculpturing in the major caste, range from Panama to the Brazilian Amazon. They are evidently nowhere common. Their anatomy, especially that of the minor caste, suggests that they were derived from within the *flavens* group as currently recognized, with *tachigaliae* forming one line and the other four species a second, independent line. The members of the *tachigaliae* group superficially resemble those of the *transversostriata* group, which have 12-segmented antennae, but the similarity may be due to convergent evolution. One species, *bahai* Forel, described from a minor, was not seen during this study.

1 Major: dorsal surface of head covered by parallel longitudinal carinulae; pronotum lacks carinulae or rugoreticulum (Guianas) ..... ***tachigaliae***

Major: dorsal surface of head covered by parallel transverse carinulae; pronotum with carinulae, rugoreticulum, or both **2**

2 Major: head ventral to eye rugoreticulate (Colombia) ..... ***dorsata***

Major: head ventral to eye carinulate **3**

3 Major: mesonotal dorsum rugoreticulate. Minor: dorsal surface of head entirely foveolate and opaque (Costa Rica to Brazil and Peru) ..... ***mendicula***

Major: mesonotal dorsum foveolate only, not rugoreticulate. Minor: dorsal surface of head either foveolate and opaque or else smooth and shiny **4**

4 Major: anterior half of pronotal dorsum bears several irregular carinulae only. Minor: dorsal surface of head entirely foveolate and opaque; distance from genal margin to eye much less than the length of the eye (Amazonian Brazil and Peru) ..... ***pedana***

Major: anterior half of pronotal dorsum rugoreticulate. Minor: dorsal surface of head entirely smooth and shiny; distance from genal margin to the eye greater than Eye Length (Suriname) ..... ***gibbata***

The *teneriffana* Group

The single species of this group, *teneriffana,* is evidently a native of North Africa and possibly also the Canary Islands. It has turned up in disturbed habitats in Cuba, Peru, and California, but as of this writing is evidently still sporadic and local.

The *transversostriata* Group

This group of small, rather rare ants, the soldiers of which have transversely carinulate heads, superficially resemble those of the *tachigaliae* group but have 12-segmented rather than 11-segmented antennae. They furthermore differ significantly in head and body shape. Members of the *transversostriata* group occur variously from Central America to Ecuador and Trinidad. They appear to be derivatives of one or more lines within the large, phenetically defined *flavens* group. One species, *bicornis,* is an obligate symbiont of *Piper* myrmecophytes.

1 Major: in side view, frontal lobes drawn out from the surface of the head as hornlike, acute-angular projections; mesonotal dorsum rugoreticulate (Central America, inhabits *Piper* myrmecophytes) ..... ***bicornis***

Major: in side view, frontal lobes rounded, not drawn out as hornlike projections; mesonotal dorsum carinulate, or foveolate, or smooth, but not rugoreticulate **2**

2 Major: occiput rugoreticulate (Costa Rica, Trinidad) ..... ***scalaris***

Major: occiput transversely carinulate, not rugoreticulate **3**

3 Major: in side view, profile of head not "dented" by a strong concavity just anterior to the occiput, instead forming a smooth, continuous convexity; space between eye and frontal lobe rugoreticulate (South America, West Indies) ..... ***transversostriata***

Major: in side view, profile of head "dented" by a strong convexity just anterior to the occiput; space between eye and frontal lobes with carinulae only **4**

4 Major: on posterior half of dorsum of head, transverse carinulae run straight across, with the anteriormost one ending at the margins of the head halfway between the eye and the level of the occiput; pronotum entirely smooth and shiny (Amazonian Brazil and Peru) ..... ***scolioceps***

Major: on posterior half of dorsum of head, transverse carinulae curve anteriorly from midline to margins of head, with the anteriormost one almost touching the eyes; pronotum foveolate and opaque, and also bearing transverse carinulae on its anterior dorsum (montane Ecuador) ..... ***gnomus***

The *tristis* Group

This exclusively Neotropical group ranges from lowland Mexico to Argentina and throughout the West Indies. It rivals the other giant *Pheidole* assemblages of the New World, the *diligens, fallax,* and *flavens* groups, in its species diversity and magnitude of adaptive radiation. Like these other groups, it is vaguely bounded and connected to other assemblages by phenetically intermediate species. Nonetheless, a suite of traits allows reasonably secure placement of the great majority of species classified with the *tristis* group in the present treatment. They include medium to large size, 4 or 5 hypostomal teeth, comparatively short antennal scapes in the major and moderately long ones in the minor, relatively small eyes set well back from the anterior genal border, and a mesonotal convexity either weakly developed or altogether absent. Also present among a third of the species are hornlike protrusions from the frontal lobes and mid-clypeal carina in the major caste and, in many, also decoration of the pronotum with conspicuous parallel transverse carinulae in the minor caste. Three very distinctive Cuban species *(alayoi, macromischoides,* and *naylae)* as well as *avia* and *bucculenta* from Brazil, *bruchi* from Argentina, *laeviventris* from Colombia, *macracantha* from Panama, *severini* from French Guiana, and *microps* and *minax* from Peru, are so far known only from minor workers and are not included in the key that follows. However, they can be readily identified from the drawings and diagnoses provided in their individual species descriptions.

1 Very large species, Head Width of major about 2.6 mm and of minor 0.8–1.0 mm. Major: in side view, either the ventral profile of the postpetiole bulges forward to form a convexity (separate from the rest of the postpetiolar sternite) as large as the petiolar node, or else the ventral profile is covered with a dense brush of medium-length hairs **2**

Smaller species, Head Width of major usually under 2.0 mm and rarely over 2.5 mm. Major: ventral profile of postpetiole concave, straight, or convex, but if convex, the protrusion is much smaller than the postpetiolar node, and at most it bears 3 or 4 hairs **3**

2 Major: profile of postpetiolar venter bearing a dense brush of medium-length hairs, and profile of petiolar venter completely lined with a dense row of uniformly short hairs; postpetiolar venter bearing convexity much smaller than the petiolar node; seen from above, lateral margins of postpetiolar node drawn into spines (southern Mexico to Argentina) ..... ***fimbriata***

Major: postpetiolar and petiolar venters at most with several hairs; and the profile of the postpetiolar venter bulges forward as a convexity as large as the petiolar node; seen from above, lateral margins of postpetiolar node smoothly rounded (southern Mexico to Amazonian Bolivia and Brazil and east to the Guianas and Tobago) ..... ***cephalica***

3(1) Major: in side view, profile of mid-clypeal longitudinal carina drawn out from the surface of the head into a lobe, angle, or spike, sometimes small but still conspicuous; or else the frontal lobe is drawn out in profile forward or downward to create a horn, tooth, or lobe whose upper margin and lower margin if extended as lines that meet would form a right angle or acute angle; or both **4**

Major: in side view, neither the mid-clypeal carina (if there is one) nor the frontal lobe is drawn out into protrusions as described above; in particular, even if the frontal lobe is drawn out in a short lobe, its upper margin and lower margin if extended as lines would meet to form an obtuse angle, not a right or acute angle **40**

4 Major: the profile of the mid-clypeal longitudinal carina (as opposed to the frontal lobes) drawn outward into at least a small protruding hornlike angle, lobe, or spike **5**

Major: the mid-clypeal profile, even if a longitudinal carina is present, is flat or slightly convex, with no part of it drawn outward as an angle, lobe, or spike (but the frontal lobes are extended this way) **18**

5 Major: entire dorsum of head and mesosoma (thorax plus propodeum) covered by mostly transverse carinulae **6**

Major: posterior half of dorsal head surface and at least the center of the promesonotal dorsum smooth, or foveolate and opaque, or partly covered by longitudinal (not transverse) carinulae **7**

6 Major: in profile, the entire clypeus bulges out into a noselike protrusion larger than the eye; in full-face view, longitudinal carinulae originating on the frontal lobes turn away from the midline of the head just anterior to the occiput and travel horizontally to the margins of the head (Amazonian Peru) ..... ***nasifer***

Major: in profile, the posterior half of the mid-clypeal carina protrudes as a blunt obtuse angle much smaller than the eye; all carinulae on the dorsal surface of the head posterior to the eyes are horizontal (Veracruz, Mexico) ..... ***triumbonata***

7(5) Major: shallow antennal scrobes present, even if each is represented only by a clear or foveolate space marked posteriorly with a curving posterior carinula **8**

Major: antennal scrobes absent **11**

8 Major: carinulae and/or rugulae cover all of posterior half of dorsal head surface except occiput **9**

Major: carinulae and/or rugulae absent from posterior half of dorsal head surface, with the exception of a single curving carinula that marks the posterior limit of the antennal scrobe on each side **10**

9 Major: lateral anterior margins of mesonotum and dorsal anterior sides of propodeum carinulate. Minor: occiput rugoreticulate (Argentina, southern Brazil) ..... ***risii*** **(in part)**

Major: lateral anterior margins of mesonotum and dorsal anterior sides of propodeum lack carinulae. Minor: occiput foveolate only, lacking rugoreticulum or other sculpture (Argentina) ..... ***rosula*** **(in part)**

10(8) Major: in side view, margin of mesonotal convexity as high as pronotal margin; anterior pronotal strip with multiple carinulae; median ocellus present. Minor: nuchal collar absent (Venezuela) ..... ***gravida***

Major: in side view, margin of mesonotal convexity much lower than pronotal margin; anterior pronotal strip with only a single carinula; ocelli absent. Minor: nuchal collar present (Venezuela) ..... ***rhytifera***

11(7) Major: in full-face view, frontal lobes square in shape, completely smooth and shining, and the distance between their outer margins 2× as great as the distance from the outer margin of either one to the nearby lateral margin of the head (Costa Rica, Colombia) ..... ***vallifica***

Major: in full-face view, the frontal lobes are lobe-shaped or angular in front, not square-shaped, and they are at least partly covered by longitudinal carinulae **12**

12 Major: in side view, center of clypeus extended as a large noselike lobe longer than the eye, and its visible part is rugoreticulate (Chocó, Colombia) ..... ***binasifer***

Major: in side view, the protrusion of the clypeus either is much smaller than the eye or, if as large, the visible part is not rugoreticulate **13**

13 Major (possibly the ant species of any genus with the most elaborate cephalic armament): the anterior clypeal margin is extended downward as 4 large teeth, one pair to a side; the center of the clypeus (viewed from the side) protrudes as a noselike appendage larger than the eye; a sharp spike projects from the uppermost margin at the center of the clypeus; and the frontal lobes project outward somewhat as additional lobes (montane Colombia) ..... ***mirabilis***

Major: in side view, bearing only a comparatively small central projection on the clypeus and, in some species, a projection of the frontal lobe **14**

14 Major: the space between eye and antennal fossa is at least partly filled by rugoreticulum (Central America, Colombia) ..... ***rhinoceros***

Major: the space between eye and antennal fossa is entirely filled by longitudinal carinulae, and lacks a rugoreticulum **15**

15 Major: strong parallel transverse carinulae cover the anterior third of the pronotal dorsum and all of the basal face of the propodeum (montane Colombia and Ecuador) ..... ***unicornis***

Major: at most, several broken transverse carinulae occur on the anterior third of the pronotal dorsum; carinulae absent from the basal face of the propodeum **16**

16 Major: in side view, profile of mesonotal convexity is triangular with an acute apex. Minor: seen from above and obliquely, propodeal spine reduced to an obtuse angle formed by the two propodeal faces (Bolivia, Costa Rica) ..... ***cornicula***

Major: in side view, profile of mesonotal convexity surmounted by at most a low secondary convexity. Minor: seen from above and obliquely, propodeal spine developed at least as a well-formed triangular denticle **17**

17 Major: moderately large species (Head Width of major 1.9–2.0 mm, of minor 0.6–0.7 mm); in side view, propodeal spine rises perpendicular to the basal face of the propodeum and is half as long; mesonotum foveolate and opaque. Minor: dorsal surface of head foveolate and opaque (Argentina, southern Brazil) ..... ***schwarzmaieri***

Major: smaller species (Head Width of major about 1.5 mm, of minor 0.6 mm); in side view, propodeal spine forms a 130-degree angle with the propodeal basal face and is only one-third as long. Minor: dorsal surface of head smooth and shiny (Costa Rica, Nicaragua) ..... ***celaena***

18(4) Major: head completely lacks rugoreticulum; its sculpture is limited to carinulae and foveolae **19**

Major: head with at least small patches of rugoreticulum, especially laterad to or behind the antennal fossae **26**

19 Major: in full-face view, longitudinal carinulae on both sides of the midline extend posteriorly all the way to the occipital border. Major and minor: in side view, propodeal spine is more than half as long as the basal face of the propodeum anterior to it, and, in the minor, the spine is curved posteriorly (montane Colombia)..... ***pidax***

Major: in full-face view, at least the posterior third of the head capsule free of carinulae, and smooth and shining. Major and minor: in side view, propodeal spine less than half as long as the basal face of the propodeum, and straight, not curved posteriorly..... **20**

20 Major: propodeal spiracle nearly half as wide as length of the eye and also as wide as base of propodeal spine; seen from above and obliquely, humerus subangulate; head capsule bicolored, with anterior half yellow and posterior half yellowish brown. Minor: in side view, propodeal spine one-third as long as propodeal basal face and pointed backward, almost level with the face (Costa Rica to Brazil and Peru)..... ***cramptoni***

Major: propodeal spiracle much less than half as wide as eye length and not as wide as base of propodeal spine; seen from above and obliquely, humerus smoothly rounded; head capsule concolorous, variously yellow to brown, or, if bicolored, anterior half is dark reddish brown. Minor: in side view, propodeal spine either is much shorter than one-third the basal propodeal face, or, if longer, it rises nearly perpendicularly to the basal face **21**

21 Major: seen from above, lateral margins of postpetiolar node are drawn out into sharp spines **22**

Major: seen from above, lateral margins of postpetiolar node are right-angular or convex, not spinose **23**

22 Major: in side view, frontal lobes extend as acute angles downward almost to the level of the anterior clypeal border (Pará, Brazil)..... ***allarmata***

Major: in side view, frontal lobes point outward, perpendicular to the head surfaces and do not approach the anterior clypeal border (Brazil) ..... ***moseni***

23(21) Major: seen from the side, promesonotal profile as a whole forms a smooth semicircle; in side view also, frontal lobe forms a triangle whose height (away from head surface) is about equal to the width of its base along the head surface. Major and minor: body yellow (Guyana)..... ***synarmata***

Major: seen from side, promesonotal profile bilobed or flattened, not semicircular; in side view also, frontal lobe forms a triangle only half as high as the base is wide. Major and minor: yellowish brown or dark brown..... **24**

24 Major: longitudinal carinulae immediately mesad to the eye extend posteriorly to halfway between the level of the eye and level of the occipital margin; a well-defined suture extends all around the boundary between prothorax and mesothorax, and in side view it divides the promesonotal profile into 2 lobes; dorsum of head concolorous dark brown (Costa Rica)..... ***hasticeps***

Major: longitudinal carinulae immediately mesad to the eye extend posteriorly only one-tenth or so the distance from level of the eye to level of the occipital margin; suture separating the prothorax and mesothorax absent from the promesonotal dorsum, the profile of which is a single flattened curve; either light yellowish brown or tricolored (head brown, mesosoma and waist yellow, gaster brown) **25**

25 Major: light yellowish brown, with a darker, indistinct brownish spot just posterior to center of the head (abundant in disturbed habitats, southern Mexico to Brazil and throughout the West Indies) ..... ***subarmata***

Major: tricolored, head medium brown, mesosoma, waist, and legs yellow, gaster light brown (montane Trinidad) ..... ***triplex***

26(18) Major: posterior half of head capsule, and all of pronotal and propodeal dorsa covered by parallel transverse carinae (Costa Rica) ..... ***arietans***

Major: transverse carinulae cover at most the pronotal dorsum and/or a small part of the occiput **27**

27 Major and minor: all of pronotal dorsum or at least its anterior half rugoreticulate **28**

Major and minor: at most, the humeri alone are rugoreticulate in major, and pronotum dorsum of minor lacks rugoreticulum entirely **31**

28 Major: in full-face view, posterior half of dorsal surface of head smooth and shiny (montane Venezuela) ..... ***hortonae***

Major: in full-face view, posterior half of dorsal surface of head mostly or entirely rugulose to rugoreticulate, with non-reticulate portion foveolate and opaque **29**

29 Major: occiput and sides of pronotum entirely rugoreticulate (southeastern Brazil) ..... ***aper***

Major: occiput and sides of pronotum rugose or foveolate, not reticulate **30**

30 Major: in full-face view, occiput longitudinally rugulose; sides of pronotum with scattered, broken longitudinal rugulae; anterior fringe of central strip of first gastral tergite foveolate and opaque. Minor: sides of pronotum rugoreticulate; in side view, propodeal spine perpendicular to the basal propodeal face and one-third as long (Panama, Costa Rica) ..... ***traini***

Major: in full-face view, occiput foveolate and opaque, lacking rugulae and carinulae; sides of pronotum covered by widely spaced, continuous transverse rugulae; first gastral tergite entirely smooth and shiny. Minor: sides of pronotum longitudinally carinulate; in side view, propodeal spine a triangular denticle less than one-tenth as long as the basal propodeal face (São Paulo, Brazil) ..... ***sigillata***

31(27) Major: in side view, frontal lobes drawn out into forward-directed, sharp, acute-angular, and upward-curving horns; seen from above and obliquely, humerus acute-angulate (Chocó, Colombia) ..... ***diabolus***

Major: in side view, frontal lobes at most right-angular, round-tipped, and not curving upward; humerus smoothly rounded **32**

32 Major: shallow antennal scrobes present and clearly demarcated by surrounding sculpture on the dorsal head surface, although not deep enough (nor are the frontal lobes expanded enough laterally) to receive the antennae **33**

Major: at most a slight trace of antennal scrobes present **38**

33 Major: rugoreticulum limited to a small patch between eye and antennal fossa (Santa Catarina, Brazil) ..... ***rosae***

Major: rugoreticulum present or not between eye and antennal fossa, but either way also occurs in a small patch either just posterior to the antennal scrobe, or just behind and above the eyes, or both **34**

34 Major: in full-face view, carinulae on dorsum of head surface extend all the way to occipital border, including occipital lobes (Ecuador) ..... ***fullerae***

Major: in full-face view, occiput lacking carinulae, its surface smooth and shiny, with or without scattered foveae **35**

35 Major: rugoreticula present as small patches behind and above the eye and also behind the posterior margin of the scrobe (Santa Catarina, Brazil) ..... ***hetschkoi***

Major: rugoreticulum present either as a small patch just behind and above the eye or else as a small patch just behind the antennal scrobe, but not both **36**

36 Major: rugoreticulum present as a small patch just behind and above the eye, but absent from just behind the posterior margin of the antennal scrobe (Ecuador) ..... ***napoensis***

Major: the reverse of above, i.e., rugoreticulum present as a small patch just behind the margin of the antennal scrobe but absent from behind and above the eye **37**

37 Major: seen in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view), profile of pronotal dorsum forms the near-perfect arc of a circle; mesonotal dorsum completely covered by transverse carinulae. Minor: entire promesonotal dorsum covered by transverse carinulae (Chocó, Colombia) ..... ***securiger***

Major: seen in dorsal-oblique view, anterior half of profile of pronotal dorsum raised as a separate lobe, and posterior half nearly flat; mesonotal dorsum mostly bare of carinulae. Minor: transverse carinulae are absent from mesonotum, and only several occur near anterior and posterior margins of pronotum (Ecuador) ..... ***guayasana***

38(32) Major: rugoreticulum mesad to the eye extends posteriorly almost to the occipital border (Costa Rica) ..... ***arachnion***

Major: rugoreticulum mesad to the eye restricted to the space between the eye and the antennal fossa **39**

39 Major: very large (Head Width 2.3 mm); reddish yellow; propodeal dorsum longitudinally carinulate; seen from above and obliquely, humerus right-angulate (southeastern Brazil, Paraguay) ..... ***praeses***

Major: small (Head Width 0.8 mm); medium to dark brown; propodeal dorsum lacking carinulae; seen from above and obliquely, humerus smoothly and evenly rounded (Bolivia) ..... ***mosenopsis***

40(3) Major: in full-face view, entire posterior third of head, up to and including occipital lobes, rugoreticulate **41**

Major: in full-face view, at least the occipital lobes and usually the entire posterior third of the head, variously smooth and shiny, foveolate, rugose, or carinulate, but not reticulate **48**

41 Major and minor: in side view, propodeal spine as long as or longer than the basal face of the propodeum anterior to it; very large (Head Width of major 2.6 mm, of minor 0.9 mm). Major: entire dorsal surface of gaster foveolate and opaque (Mexico) ..... ***ursus***

Major and minor: in side view, propodeal spine only one-third as long as the propodeal basal face, or shorter; medium-sized to large (Head Width of major 1.1–2.2 mm, of minor 0.6–0.7 mm). Major: at least the posterior three-quarters of first gastral tergite smooth and shiny **42**

42 Major: entire mesosoma enveloped in groups of variously transverse, longitudinal, or even concentric semicircular carinulae. Minor: dorsal surfaces of head and mesosoma covered by transverse or semicircular carinulae **43**

Major and minor: body and head mostly rugose and rugoreticulate, not enveloped by carinulae as described above **44**

43 Major: in side view, entire area of head behind (ventral) and posterior to the eye rugoreticulate. Minor: propodeal spine present; nuchal collar (behind occiput) absent (Costa Rica to Ecuador) ..... ***ectatommoides***

Major: in side view, almost all of the area of head behind (ventral) and posterior to the eye smooth and shining, bearing only a few longitudinal carinulae. Minor: propodeal spines absent; nuchal collar present (Chocó, Colombia) (placed in the *fallax* group; also keyed out here to ensure identification) ..... ***tigris***

44(42) Major: in full-face view, head capsule square; long axes of the frontal lobes pointed away from each other at right angles and in the direction of the anterior corners of the head (montane Atlantic forest, Brazil) ..... ***dyctiota***

Major: in full-face view, head subrectangular or else somewhat heart-shaped; long axes of frontal lobes are approximately parallel and point forward toward the middle of the anterior clypeal border **45**

45 Major: dorsal surface of head capsule entirely rugoreticulate, except for antennal fossae, clypeus, and frontal triangle. Minor: in side view, anterior portion of basal face of propodeum drops precipitously through a right angle followed by steeply vertical descent to the metanotal groove (São Paulo, Brazil) ..... ***lutzi***

Major: frontal lobes lack rugoreticulum; they are covered instead by parallel longitudinal carinulae or rugulae. Minor: basal face of propodeum descends anteriorly to the metanotal groove through an even convexity followed by a gently oblique slope **46**

46 Major: longitudinal carinulae cover frontal lobes and extend posteriorly only to the level of the posterior margin of the eye; center of side of pronotum rugoreticulate (São Paulo, Brazil, and Misiones, Argentina) ..... ***bambusarum***

Major: longitudinal carinulae cover frontal lobes and extend posteriorly over central dorsal surface of head to halfway between the level of the posterior margin of the eye and the level of the occipital margin; center of side of pronotum smooth and shiny **47**

47 Major: lower half of mesopleuron entirely rugoreticulate; seen from above and obliquely, humerus subangulate. Minor: entire side of mesosoma rugoreticulate; propodeal spine well developed (southeastern Brazil) ..... ***brevicona***

Major: lower half of mesopleuron entirely smooth and shiny; seen from above and obliquely, humerus smoothly rounded. Minor: entire side of mesosoma smooth and shiny; propodeal spine reduced to simple right angle (Costa Rica) ..... ***iracunda***

48(40) Major: in full-face view, parallel longitudinal carinulae that cover the frontal lobes continue posteriorly over the dorsal head surface halfway or more to the occiput, while turning laterally away from the midline and curving transversely to the lateral margins of the head above the eye **49**

Major: in full-face view, either the parallel longitudinal carinulae that cover the frontal lobes do not turn laterally, or if they do turn, they fail to reach the sides of the head **50**

49 Major: seen from the side, carinulae posterior to the eye continue curving downward to cover all of the gena, hence the entire side of the head; carinulae arising from the frontal lobes reach the occiput; transverse carinulae completely cover the promesonotum. Minor: head and pronotum foveolate and opaque (Costa Rica) ..... ***glyphoderma***

Minor: seen from the side, carinulae posterior to the eye do not continue behind (laterad to) the eye, leaving most of the gena smooth and shiny; promesonotum with only a few scattered transverse carinulae, mostly smooth and shiny. Minor: head and pronotum smooth and shiny (Honduras) ..... ***walkeri***

50(48) Major: parallel longitudinal rugae or carinulae covering the frontal lobes continue straight back to the middle of the head capsule, where they break up into a rugoreticulum, which is in turn succeeded posteriorly by a second, extensive stretch of rugulae or carinulae that continue on to the occipital border **51**

Major: sculpturing on and posterior to the frontal lobe does not display the alternating pattern described above **52**

51 Major: parallel rugulae arise posteriorly to the rugoreticulum in center of head, then are succeeded by others that continue on straight (in parallel to the midline of the head) directly to the occipital border; in side view, posterior-ventral quarter of the head capsule mostly smooth and shiny (Trinidad and Venezuela) ..... ***coveri***

Major: parallel carinulae that rise behind the rugoreticulum in center of head proceed away from midline obliquely outward to the occipital corners; in side view, posterior quarter of the head capsule rugoreticulate and carinulate (central and southeastern Brazil) ..... ***senilis***

52(50) Major and minor: at least the anterior third of pronotal dorsum rugoreticulate **53**

Major and minor: the anterior third of pronotal dorsum variously smooth, foveolate, transversely carinulate, or transversely rugulose, but not rugoreticulate **55**

53 Major: in full-face view, posterior third of dorsal surface of head covered by parallel longitudinal carinulae; mesonotum rugoreticulate (Ecuador, Peru) ..... ***horribilis***

Major: in full-face view, posterior third of head smooth and shiny, with at most scattered foveae; mesonotum smooth and shiny **54**

54 Major: dorsum of postpetiolar node foveolate and opaque, with faint longitudinal carinulae; posterior third of head with scattered conspicuous foveae. Minor: nuchal collar present (Suriname, Bolivia) ..... ***terribilis***

Major: dorsum of postpetiolar node smooth and shiny; foveae lacking on posterior third of head. Minor: nuchal collar absent (Guatemala to Colombia) ..... ***gauthieri***

55(52) Major: at least a small portion of the dorsal surface of the head is rugoreticulate, usually in the space between the eye and antennal fossa **56**

Major: no trace of rugoreticulum occurs on the dorsal surface of the head; all of the nonfoveolate sculpturing consists of carinulae or rugulae, without cross-connections **80**

56 Major: a rugoreticulum covers the entire dorsum of the head except for the occiput, clypeus, and inner parts of the antennal fossae (Misiones, Argentina) ..... ***trachyderma***

Major: rugoreticulum does not cover the entire central part of the head as described above **57**

57 Major: in full-face view, carinulae or rugulae just mesad and posterior to the eye extend posteriorly all the way to the margins of the occipital lobes **58**

Major: in full-face view, carinulae or rugulae just mesad and posterior to the eye fall short of the occipital lobes **63**

58 Major and minor: in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view), profile of humerus is an acute angle projecting well above the profile of the rest of the promesonotum (Panama) ..... ***pilispina***

Major and minor: seen in dorsal-oblique view, profile of humerus smoothly rounded, at most only slightly elevated above the profile of the rest of the promesonotum **59**

59 Major: a well-marked and extensive patch of rugoreticulum present just behind (i.e., laterad to) eye (Ecuador) ..... ***bulliceps***

Major: rugoreticulum not present behind eye; at most several cross-carinulae present **60**

60 Major: promesonotum lacking carinulae (Guatemala) ..... ***deceptrix***

Major: promesonotum covered by transverse carinulae **61**

61 Major: in side view, profile of mesonotum descends to metanotal groove through a vertical face. Minor: pronotum lacking rugulae or rugoreticulum (Bolivia) ..... ***bison***

Major: in side view, profile of mesonotum descends to metanotal groove at a 45-degree angle. Minor: at least the anterior third of pronotum covered by rugulae or rugoreticulum **62**

62 Major: seen from above, lateral margins of postpetiolar node form obtuse angles; width of postpetiolar node is less than 2× the width of the petiolar node; shallow, inconspicuous antennal scrobes present. Minor: seen from above, posterior half of pronotal dorsum and all of mesonotal dorsum foveolate only, lacking rugoreticulum (Bolivia) (placed in the *flavens* group; also keyed out here to ensure identification) ..... ***mittermeieri***

Major: seen from above, lateral margins of postpetiolar node form acute-angular spines; antennal scrobes absent. Minor: entire promesonotal dorsum rugoreticulate (Misiones, Argentina) ..... ***rugatula***

63(57) Major: carinulae or rugulae immediately mesad to eye reach two-thirds or more the distance from the level of the posterior margin of the eye to the level of the margin of the occipital lobes **64**

Major: carinulae or rugulae immediately mesad to eye reach only halfway or less from the level of the posterior margin of the eye to the level of the margin of the occipital lobes **69**

64 Major: pronotal dorsum lacks carinulae **65**

Major: pronotal dorsum with numerous, fragmented carinulae **66**

65 Major: pronotal dorsum foveolate and opaque; in side view, profile of posterior half of head, just anterior to the occiput, concave; many of the hairs lining profile of dorsal surface of head are 2× length of the eye (Chiapas, Mexico ..... ***variceps***

Major: pronotal dorsum entirely smooth and shiny; in side view, profile of posterior half of head convex; longest hairs lining profile of head are only about 1× length of eye (Guianas to Bolivia and Peru) (placed in the *fallax* group; also keyed out here to ensure identification) ..... ***astur***

66(64) Major: rear half of the dorsal head surface (exclusive of the occipital lobes, which are smooth and shiny) covered with a loose, large-celled rugoreticulum with shiny interspaces (Pará, Brazil) ..... ***alexeter***

Major: rear half of dorsal surface of head (exclusive of the occipital lobes) covered by parallel longitudinal carinulae **67**

67 Major: antennal scrobe absent. Minor: in full-face view, occipital border convex, with nuchal collar present (São Paulo, Brazil, Ecuador) ..... ***sarcina***

Major: shallow antennal scrobe present. Minor: in full-face view, occipital border concave, lacking nuchal collar **68**

68 Major: dorsal surface of mesonotum with broken transverse carinulae. Minor: posterior half of dorsal head surface and anterior half of pronotal dorsum covered by transverse carinulae (Argentina, southern Brazil) ..... ***risii*** **(in part)**

Major: dorsal surface of mesonotum lacking carinulae. Minor: posterior half of dorsal head surface and anterior half of pronotum lack carinulae (Argentina) ..... ***rosula*** **(in part)**

69(63) Major: antennal scape 2× broader near its insertion than along transects of its distal half (Brazil, Bolivia) (placed in the *fallax* group; also keyed out here to ensure identification) ..... ***claviscapa***

Major: antennal scape much less wide near its insertion than along transects of its distal half **70**

70 Major: seen in full-face view, 2 to several or more carinulae originating behind the frontal triangle run along and close to the midline of the dorsum of the head to reach the occipital border **71**

Major: in full-face view, the carinulae running along the midline of the dorsum of the head fail to reach the occipital border by 1× the length of the eye or more **76**

71 Major: shallow antennal scrobes present; frontal lobes and pronotal humeri partially rugoreticulate (southeastern Brazil) ..... ***heyeri***

Major: antennal scrobes absent; frontal lobes and pronotal humeri lack rugoreticulum **72**

72 Major: carinulae close to posterior third of the dorsal midline of the head travel obliquely and posteriorly away from their origin on or near the midline; occipital lobes dotted with sparse but conspicuous foveae; dorsum of postpetiolar node covered by transverse carinulae (Colombia) ..... ***steinheili***

Major: carinulae close to posterior third of the dorsal midline of head travel parallel to it; occipital lobes lack conspicuous foveae; dorsum of postpetiolar node mostly smooth and shiny **73**

73 Major: a rugoreticulum extends all the way laterad from the outermost carinulae that curve around the antennal fossa to reach the eye; many hairs along the dorsal profile of first gastral tergite 3× the length of the eye. Minor: in full-face view, head narrowed only slightly to rear, and occiput broad and concave, lacking nuchal collar (Veracruz, Mexico) ..... ***sabina***

Major: the rugoreticulum between antennal fossa and the eye is restricted to a small patch posterior to the outermost curving carinulae of the fossa; hairs along the dorsal profile of the first gastral tergite 2× the length of the eye or less. Minor: in full-face view, head narrowed strongly to rear, and occiput short, with or without nuchal collar **74**

74 Major: mesosomal dorsum (pronotum to propodeum) lacks carinulae and rugulae (Amazonian Peru) ..... ***manuana***

Major: pronotal humeri and propodeal dorsum with carinulae or rugulae **75**

75 Major: longitudinal carinulae cover entire side of the propodeum; seen from above and obliquely, pronotal humerus subangulate. Minor: nuchal collar present behind occiput; propodeal spine absent (Colombia) ..... ***amata***

Major: most of the side of the propodeum bare of carinulae; seen from above and obliquely, pronotal humerus evenly rounded. Minor: nuchal collar absent; well-developed propodeal spine present (St. Vincent and Grenada) ..... ***antillana***

76(70) Major: seen from the side, the ventral profile of the postpetiole bulges downward in a strong and conspicuous convexity **77**

Major: seen from the side, the ventral profile of the postpetiole is straight or weakly convex **78**

77 Major: shallow antennal scrobes present; in side view, mesonotum descends almost vertically to the metanotal groove. Minor: pronotal dorsum covered by concentric circular carinulae (Argentina) ..... ***pullula***

Major: antennal scrobes absent; in side view, mesonotum descends very gently and on an oblique slope to the metanotal groove. Minor: pronotal dorsum lacks carinulae of any kind (Costa Rica) ..... ***excubitor***

78(76) Major: dorsal profile of mesosoma (i.e., promesonotum and propodeum) bearing only several scattered hairs, which are shorter than the length of the eye; in side view, outline of propodeal spine forms a large equilateral triangle whose base is as long as the basal face of the propodeum anterior to it. Minor: in full-face view, occiput is broad, flat, and lacks a nuchal collar (Argentina, Bolivia) ..... ***gigaflavens***

Major: dorsal profile of mesosoma with dense hairs as long as or longer than the length of the eye; in side view, propodeal spine is either a denticle or short, acute spine whose base is less than half the length of the basal face of the propodeum directly anterior to it. Minor: in full-face view, occiput is narrow and possesses a nuchal collar **79**

79 Major and minor: pronotum lacks carinulae; in side view, mesonotal convexity is very low and barely discernible, and the rest of the promesonotal profile rises at the center to form a blunt obtuse angle (Pará, Brazil) ..... ***rutilana***

Major and minor: anterior third of pronotal dorsum covered by parallel transverse carinulae; mesonotal convexity well developed, and the rest of the promesonotal profile smoothly rounded (Amazonian Peru) ..... ***peruviana***

80(55) Major: in side view, propodeal spine absent, with the basal and declivitous faces of the propodeum meeting in a blunt obtuse angle; in full-face view, dorsal surface of head of major almost entirely covered by parallel longitudinal carinulae, and of minor mostly by curving transverse carinulae (Ecuador) (placed in the *diligens* group; also keyed out here to ensure identification) (see also *seligmanni* in the *diligens* group) ..... ***riveti***

Major: in side view, propodeal spine well developed, at least as a denticle. Cephalic sculpturing highly variable among species **81**

81 Major: in full-face view, outline of head capsule (exclusive of mandibles) forms a near-perfect circle, with some flattening along the clypeal and occipital borders; in side view, the mesonotal dorsal border descends posteriorly in an almost vertical face to the metanotal groove (Colombia) **82**

Major: in full-face view, outline of head capsule variously heart-shaped, subrectangular, or oval, but never approaching a slightly flattened circle; in side view, the mesonotal dorsal border usually descends obliquely to the metanotal groove **84**

82 Major: in side view, the entire dorsal surface of the head and all of the mesosoma devoid of pilosity (Chocó, Colombia) ..... ***sphaerica***

Major: in side view, at least the anterior half of the dorsal surface of the head and all of the promesonotum covered by dense standing hairs **83**

83 Major: in side view, posterior half of the dorsum of the head capsule flattened, its profile straight, and the length of the occipital margin in profile about equal to the length of the combined anterior clypeal and genal profiles; the margin of the posterior half of the head capsule and occiput covered by dense pilosity (Colombia) ..... ***subsphaerica***

Major: in side view, posterior half of the head capsule swollen, its profile strongly convex, and the length of the occipital margin in profile 2× greater than the length of the combined anterior clypeal and genal profiles; the margin of the posterior half of the head capsule and occiput completely devoid of pilosity (Chocó, Colombia) ..... ***pepo***

84(81) Major: in full-face view, most or all of the carinulae in the central third of the dorsum of the head reach all the way to the occipital margin or at least within an eye-length of it **85**

Major: in full-face view, at most only several carinulae, or none at all, reach within an eye-length of the occipital margin **93**

85 Major: in full-face view, carinulae covering occiput are transverse; those just anterior to the occiput are also transverse, originating from carinulae that start on the frontal lobes and turn inward and horizontally toward the dorsum midline as they approach the occiput; shallow antennal scrobes present; lateral margins of the postpetiolar node viewed from above spinose (Bahamas) ..... ***androsana***

Major: in full-face view, carinulae covering all of dorsal surface of head, including those reaching the occiput, are entirely longitudinal; antennal scrobes absent; postpetiolar node variable in shape **86**

86 Major: in full-face view, longitudinal carinulae mesad and posterior to eyes extend posteriorly to the occiput, so that the entire dorsal surface of the head (exclusive of clypeus and frontal triangle) is carinulate **87**

Major: in full-face view, longitudinal carinae mesad and posterior to the eye extend posteriorly only halfway to two-thirds from the level of the posterior margin of the eye to the level of the margin of the occipital lobes **89**

87 Major: in side view, anterior two-thirds of the ventral margin of postpetiolar sternite bulges downward to form a strong convexity lower than the posterior third of the margin; center of mesopleuron longitudinally carinulate; first gastral tergite shagreened and opaque for its entire length (Costa Rica, Colombia) ..... ***grantae***

Major: in side view, entire ventral margin of postpetiolar sternite straight; mesopleuron lacks carinulae; at most, anterior third of gastral tergite shagreened and opaque **88**

88 Major: entire pronotal dorsum covered by transverse carinulae, which also curve downward and posteriorly to cover most of the pronotal side; first gastral tergite smooth and shiny. Minor: seen full face, entire dorsal surface of head covered by widely spaced carinulae (southeastern Brazil) (placed in the *flavens* group; also keyed out here to ensure identification) ..... ***tetrica***

Major: only the anterior third of the pronotal dorsum covered by transverse carinulae, which do not curve down and back to cover the pronotal side; anterior third of central half of first gastral tergite shagreened and opaque. Minor: posterior half of dorsal head surface lacks carinulae (southern Mexico to Amazonian Peru) ..... ***tristicula***

89(86) Major: entire promesonotal dorsum covered by transverse carinulae **90**

Major: carinulae limited to anterior half of promesonotal dorsum **92**

90 Major: seen from above, postpetiolar node is semicircular (bell-shaped), widening gradually through curving sides from the anterior margin to the straight posterior margin. Minor: occipital border broad, lacking a nuchal collar (Costa Rica, Colombia) ..... ***exarata***

Major: seen from above, the postpetiolar node is roughly hexagonal, its widest part near the center, between the blunt obtuse angles of the lateral margins. Minor: occipital border narrow, with a thin nuchal collar **91**

91 Major and minor: in side view, dorsal profiles of head and mesosoma with fewer than 10 hairs, and in the minor, several of the hairs are clavate. Minor: posterior half of the dorsal surface of the head almost entirely free of carinulae (Mato Grosso, Brazil) ..... ***germaini***

Major and minor: in side view the dorsal profiles of head and mesosoma with dense, long pilosity, and none of the hairs in the minor are clavate. Minor: posterior half of the dorsal surface of the head is covered by longitudinal and outward curving carinulae (Colombia) ..... ***vomer***

92(89) Major: carinulae on pronotal dorsum limited to its extreme anterior rim; postpetiolar dorsum foveolate and opaque; body brownish red to light brown. Minor: in side view, propodeal spine pointed to rear, forming a 130-degree angle with the basal face of the propodeum; posterior half of dorsum of head foveolate and opaque (Costa Rica, Amazonian Brazil, and Peru) ..... ***carapuna***

Major: transverse carinulae cover anterior third of pronotal dorsum; postpetiolar dorsum smooth and shiny; body yellow with reddish tinge. Minor: in side view, propodeal spine pointed slightly forward, forming an angle of less than 90 degrees with the basal face of the propodeum; posterior half of dorsum of head smooth and shiny (Amazonian Peru) ..... ***cuprina***

93(84) Major: in full-face view, 2 to several carinulae running posteriorly along the midline of the dorsum of head reach all the way to the margin of the occipital border **94**

Major: in full-face view none of the carinulae reaches the occipital margin **102**

94 Major: carinulae laterad to frontal lobes and posterior to the circular carinulae of the antennal fossae travel obliquely outward from the antennal lobes toward the lateral margins of the head, forming a 45-degree angle with the long axis of the head; in side view, center of ventral profile of postpetiolar sternite bulges downward as a conspicuous convexity; large (Head Width 2.0 mm); reddish yellow (southern Brazil and Misiones, Argentina) ..... ***auropilosa***

Major: carinulae laterad to frontal lobes and posterior to the circular carinulae of the antennal fossae travel straight back, remaining parallel to the long axis of the head; in side view, ventral profile of postpetiolar sternite straight or bulging slightly toward the front or rear, not in the center; size variable among species, usually well below 2.0 mm; color variable among species **95**

95 Major: seen in dorsal-oblique view (mesosoma rotated around long axis 45 degrees from top view), pronotal humerus very prominent, subangular, its apex forming a blunt right angle (Rio de Janeiro, Brazil) **96**

Major: seen in dorsal-oblique view, pronotal humerus only slightly prominent, with its apex forming an obtuse angle **97**

96 Major: transverse carinulae present on anterior fourth of pronotal dorsum and along the humeri. Minor: nuchal collar present; carinulae present on frontal lobes, and those immediately mesad to eye extend posteriorly most of the way from the eye to the occipital border; posterior half of dorsum of head foveolate and opaque (southeastern Brazil) ..... ***alpinensis***

Major: pronotal dorsum, including humeri, free of carinulae. Minor: nuchal collar absent; carinulae absent from frontal lobes, and those immediately mesad to eye do not extend posteriorly beyond the eye; posterior half of dorsum of head smooth to sparsely foveolate, and feebly shiny (southeastern Brazil, north-central Argentina) ..... ***tristis***

97(95) Major: in side view, a distinct mesonotal convexity is lacking; the promesonotal profile proceeds to the rear as a single smooth convexity until it drops off through a posterior face to the metanotal groove **98**

Major: in side view, mesonotal convexity well formed, with sloping anterior and posterior faces **99**

98 Major: posterior half of head bears scattered coarse foveae; dorsum of promesonotum entirely carinulate; postpetiolar node from above with acute-angular margins (Dominican Republic) ..... ***hispaniolae***

Major: posterior half of head lacks foveae; dorsum of promesonotum mostly smooth and shiny; postpetiolar node from above with right-angular margins (Minas Gerais, Brazil) ..... ***fera***

99(97) Major: pronotal dorsum mostly smooth, with a few carinulae along anterior border; upper half of mesopleuron foveolate and opaque. Minor: posterior third of dorsal head surface entirely smooth and shiny; nuchal collar present (São Paulo, Brazil) ..... ***ambigua***

Major: pronotal dorsum mostly or entirely covered by transverse carinulae; upper half of mesopleuron smooth and shiny. Minor: posterior third of dorsal head surface rugoreticulate or transversely carinulate; nuchal collar present or absent **100**

100 Minor (note: not major): all of posterior third of head dorsum as well as pronotum smooth and shiny, devoid of rugoreticulum or carinulae; nuchal collar present; propodeal spines absent (São Paulo, Brazil) ..... ***bucculenta***

Minor (note: not major): posterior third of dorsal head surface rugoreticulate or carinulate; nuchal collar absent; propodeal spines present **101**

101 Minor (note: not major): posterior third of dorsal head surface rugoreticulate (Santa Catarina, Brazil; northern Argentina) ..... ***guilelmimuelleri***

Minor (note: not major): posterior half of dorsal head surface transversely carinulate (São Paulo, Brazil) ..... ***avia***

102(93) Major: antennal scape approaches the margin of the occipital corner to within its own maximum width; head broader than long (Head Width exceeds Head Length) (montane Colombia) ..... ***huilana***

Major: antennal scape does not approach margin of the occipital corner closer than by 4× its own maximum width; head longer than wide and usually considerably so **103**

103 Major: in side view, promesonotum greatly enlarged dorsally, forming a single massive subrectangular convexity above the level of the basal face of the propodeum that is higher than the height (top-to-bottom dimension) of the entire propodeum itself (Colombia) ..... ***bellatrix***

Major: in side view, promesonotum forming a low convexity, with or without a separate mesonotal convexity, that is much lower than the height (top-to-bottom dimension) of the entire propodeum **104**

104 Major: eye placed far forward on the head, its anterior margin separated from the anterior genal border (just in front of it) by a distance equal to or less than the length of the eye (montane Costa Rica) ..... ***boltoni***

Major: eye set well back on the head, separated by a distance at least 1.5× the length of the eye **105**

105 Major and minor: seen from the side, propodeal spine three fourths as long as the basal face of the propodeum anterior to it. Major: large (Head Width 2.4 mm) and body rich brownish red, or "brick red" in color (Costa Rica) ..... ***rogeri***

Major and minor: seen from the side, propodeal spines less than half as long as the basal face of the propodeum anterior to it. Size and color among species variable **106**

106 Major: postpetiolar node seen from above more than 2.5× as wide as the petiolar node, and its lateral margins are drawn out into sharp spines **107**

Major: postpetiolar node seen from above rarely more than 2× as wide as the petiolar node, and if so, its margins are at most angulate, not spinose **108**

107 Major: mesonotum lacks carinulae. A large species, the Head Width of major 1.9–2.3 mm and of minor 0.7–0.8 mm (Argentina, Uruguay, southern Brazil) ..... ***spininodis***

Major: mesonotum mostly covered by transverse carinulae. A smaller species, the Head Width of major 1.6 mm and of minor 0.6 mm (Cuba) ..... ***bakeri***

108(106) Major: seen in side view, posterior half of the mesonotum drops vertically to the metanotal groove, creating a distinct declivitous face that meets the horizontal face anterior to it in a right angle (Colombia) ..... ***incisa***

Major: seen in side view, mesonotum descends to the metanotal groove obliquely, forming a 45-degree angle or less to the surface of the promesonotum anterior to it **109**

109 Major: pronotal dorsum covered by longitudinal carinulae(southern Brazil) ..... ***brunnescens***

Major: in various species pronotum smooth, foveolate, transversely rugulose, or transversely carinulate, but not longitudinally carinulate **110**

110 Major: pronotal dorsum, including upper surface of humerus, covered by transverse rugulae, and sides of pronotum, including lower surface of humerus, covered by vertical carinulae (running up and down); large (Head Width 2.0 mm), with prominent humeral projections (southeastern Brazil) ..... ***gibba***

Major: pronotal dorsum in various species smooth, foveolate, or carinulate, but not rugulose; carinulae, if present on side of pronotum, not aligned as described above; size and humerus variable **111**

111 Major: humeri very large, so that when viewed directly from above they extend past the rounded margins of the rest of the pronotum below them, their profiles creating independent, prominent blunt angles or lobes **112**

Major: humeri, whatever their shape, do not extend beyond the margins of the pronotum below them **116**

112 Major: in side view, the entire profiles of the dorsal surfaces of the head and mesosoma (thorax plus propodeum) bear only 10 or so hairs; in profile, anterior half of the ventral margin of postpetiole extends forward and downward as an acute-angular tooth (Colombia) ..... ***tristops***

Major: profiles of dorsal surfaces of head and mesosoma abundantly pilose; in profile, ventral margin of postpetiole straight, or projecting downward as a rounded convexity **113**

113 Major and minor: entire promesonotum covered by transverse carinulae; first gastral tergite foveolate and opaque (Amazonian Peru) ..... ***zoster***

Major and minor: promesonotum at least partly free of carinulae, and smooth and shiny; first gastral tergite smooth and shiny **114**

114 Major: carinulae just mesad to eye extending past eye for about one-third the distance from the level of the posterior margin of the eye to the level of the posterior margin of the occipital lobes; in full-face view, head capsule narrows past the transverse midline, giving its outline an overall oval shape. Major and minor: in side view, propodeal spine reduced to triangular form about as wide at the base as tall to the apex (Colombia) ..... ***eriophora***

Major: either carinulae are not present immediately mesad to the eye or, if present, they do not extend posteriorly past the posterior margin of the eye; in full-face view the head continues to widen slightly past the transverse midline, making its outline overall subrectangular or heart-shaped. Major and minor: in side view, propodeal spine well developed, much longer than it is broad at the base **115**

115 Major: carinulae absent from the space immediately mesad to the eye and absent from the frontal lobes; eye very small, its length only one-fourth the distance from its anterior margin to the anterior margin of the gena directly anterior to it (Panama to northwestern Brazil) ..... ***stulta***

Major: carinulae present in the space immediately mesad to the eye and on the frontal lobes; eye of medium size, more than one-third as long as the distance from its anterior margin to the anterior margin of the gena (Amazonian Bolivia, Brazil, and Peru) ..... ***polita***

116(111) Major: no carinulae present in the space immediately mesad to the eyes, and no straight longitudinal carinulae present anywhere on the dorsal surface of the head except on the frontal lobes; head strikingly elongate (Head Length 1.3× Head Width) (southern Texas to Central America) ..... ***absurda***

Major: longitudinal carinulae present in the space immediately mesad to the eyes; head variable in length, but Head Length never exceeds 1.2× Head Width **117**

117 Major: dorsal head surface posterior to the level of the eyes covered by evenly spaced elongate foveolae whose long axes are all parallel to the long axis of the head, with fine punctures in between, the surface overall feebly shiny (Ecuador) ..... ***rotundiceps***

Major: dorsal head surface posterior to the level of the eyes not the unique type described above, but instead variously bearing longitudinal carinulae and circular foveolae, or else wholly smooth and shiny **118**

118 Major: shallow antennal scrobes present; the frontal lobes broadened to accommodate the scrobes; the lobes together in full-face view more than half as wide as the total head width; head moderately elongate (Head Length 1.2× Head Width); dorsal head surface brownish yellow with a fuzzy circular brown spot on the vertex (montane Venezuela) ..... ***eparmata***

Major: antennal scrobes lacking; the frontal lobes not broadened, and together are only about one-third as wide as the total head width; head not elongated and not bicolored as described above **119**

119 Major: seen from above, the postpetiolar node is bell-shaped, with its least width at the anterior border and greatest width at the posterior border **120**

Major: seen from above, the postpetiolar node is variously oval or hexagonal, with its greatest width across the center or close to the center **123**

120 Major: pronotal dorsum at most with one or 2 transverse carinulae on its anterior margin; no more than several longitudinal carinulae occur on the frontal lobes. Minor: occiput with nuchal collar (Amazonian Brazil) ..... ***grandinodus***

Major: pronotal dorsum with transverse carinulae at least along the lateral margins for a third or more of its entire length, front to back; longitudinal carinulae densely packed on frontal lobes. Minor: occiput lacking nuchal collar **121**

121 Major and minor: pronotal dorsum completely covered by transverse carinulae. Minor: longitudinal carinulae immediately mesad to eye extend posteriorly past the posterior margin of the eye (Bolivia, Venezuela) ..... ***balzani***

Major: transverse carinulae of pronotal dorsum restricted to anterior half or else the lateral margins. Minor: pronotum free of carinulae; longitudinal carinulae mesad to eye do not reach posterior margin of eye **122**

122 Major: in dorsal-oblique view the humerus is greatly extended, its height surpassing 2× that of the mesonotal convexity; lower half of the mesopleuron smooth (Venezuela) ..... ***obrima***

Major: in dorsal-oblique view the humerus is only slightly higher than the mesonotal convexity; mesopleuron carinulate (Colombia) ..... ***gaigei***

123(119) Major: lower half of mesopleuron transversely carinulate **124**

Major: lower half of mesopleuron lacks carinulae **125**

124 Major: seen from above, margins of humeri and posterior slope of mesonotal convexity lined with transverse carinulae; seen from side, ventral profile of postpetiolar sternite slightly concave; body dark reddish to blackish brown (Panama, Colombia)..... ***superba***

Major: seen from above, entire promesonotum, including humeri, lack carinulae; seen from side, anterior half of ventral postpetiolar profile bulges forward and downward as a lobe; body dark reddish yellow (Ecuador) ..... ***sarpedon***

125(123) Major and minor: in full-face view, the posterior profile of the head, from the eyes to and including the occiput, almost devoid of hairs (Argentina, southeastern Brazil)..... ***descolei***

Major and minor: in full-face view, the posterior profile of the head ringed by abundant pilosity **126**

126 Major: in side view, the mesonotal convexity is absent, and the entire promesonotal profile forms a single continuous convexity **127**

Major: in side view, the mesonotal convexity is low but distinct, breaking the line of the promesonotal profile **128**

127 Major: in side view, the center of the pronotal dorsal profile rises to a low, blunt obtuse angle, and behind it the remainder of the promesonotal profile is straight; feeble longitudinal carinulae cover the side of the pronotum. Minor: occiput broad, flat, and lacking a nuchal collar (Bolivia)..... ***nigella***

Major: in side view, the pronotal dorsal profile is not subangulate, and the entire promesonotal profile forms a single smooth arc of a circle. Minor: occiput narrow, convex, and with a nuchal collar (Panama, Ecuador)..... ***jivaro***

128(126) Major: in side view, a small but prominent convexity arises from the center of the ventral profile of the postpetiole. Minor: carinulae mesad to the eye are circular **129**

Major: in side view, ventral profile of the postpetiole straight. Minor: carinulae mesad to the eye are straight **130**

129 Major: mesonotum mostly covered by transverse carinulae. Minor: posterior half of dorsum of head covered by faint transverse carinulae (St. Vincent, West Indies)..... ***godmani***

Major: mesonotum bare of carinulae. Minor: posterior half of dorsum of head lacks transverse carinulae (Dominica, West Indies) ..... ***laudatana***

130(128) Major: anterior third and lateral margins of pronotal dorsum lined with transverse carinulae; lateral margins of postpetiolar node acute-angular. Minor: carinulae absent from space immediately mesad to the eye; propodeal spine reduced to a low denticle shorter than the width of the propodeal spiracle (Costa Rica) ..... ***prattorum***

Major: pronotal dorsum free of carinulae; lateral margins of postpetiolar node smoothly rounded. Minor: carinulae present immediately mesad to eye; propodeal spine well developed, much longer than the width of the propodeal spiracle (Colombia to southern Brazil) ..... ***fabricator***

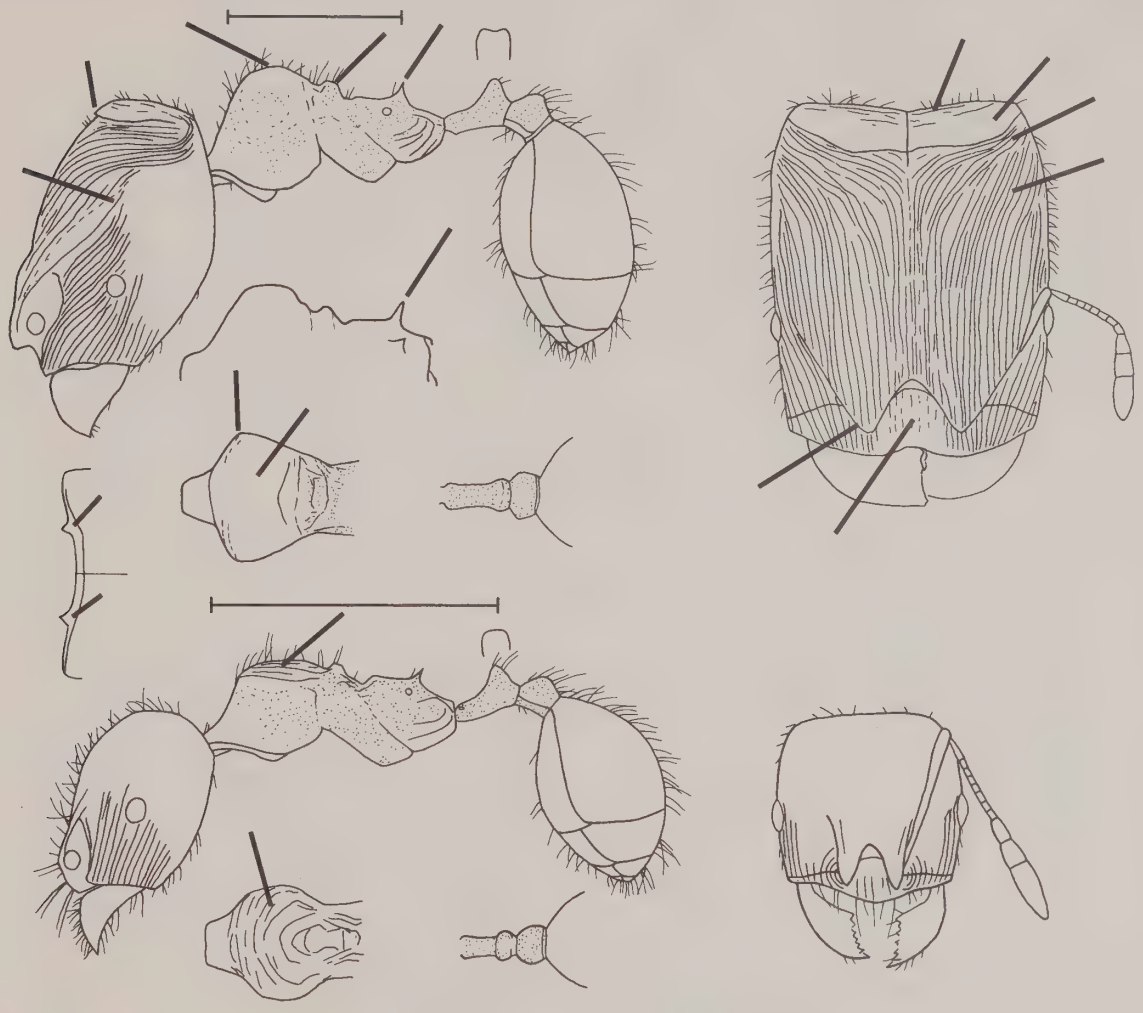
The New World Species

Repositories of New World *Pheidole* Types

The following institutions are given as used in the species descriptions that follow.

Amer. Mus. Nat. Hist.	American Museum of Natural History Central Park West at 79th Street, New York, New York 10024, USA (part of the W. M. Wheeler Collection)
Florida State Collection of Arthropods	Bureau of Entomology, State of Florida PO Box 1269, Gainesville, Florida 32602, USA (M. Naves Collection)
INBio.	Instituto Nacional de Biodiversidad, San José, Costa Rica
Inst. Miguel Lillo Tucumán	Instituto Miguel Lillo, Universidad Nacional de Tucumán Miguel Lillo 205, San Miguel de Tucumán, Argentina (N. Kusnezov Collection)
Istituto di Entomologia "Guido Grandi"	Via Filippo Re 5, 40126 Bologna, Italy (C. Menozzi Collection)
Mus. Civ. Stor. Nat. Genova	Museo Civico di Storia Naturale "Giacomo Doria" Via Brigata Liguria, No. 9, I-16121 Genova, Italy (C. Emery Collection)
Mus. Comp. Zool. Harvard	Museum of Comparative Zoology, Harvard University 26 Oxford Street, Cambridge, Massachusetts 02138-2902, USA (general collections of *Pheidole*)
Mus. Hist. Nat. Genève	Muséum d'Histoire Naturelle Route de Malagnou 1, CH-1211 Genève 6, Switzerland (A. Forel Collection)
Mus. National Hist. Nat. Paris	Museum National d'Histoire Naturelle 45 rue Buffon, F-76005 Paris, France (J. Roger Collection)
Mus. Zool. Univ. São Paulo	Museu de Zoologia, Universidade de São Paulo Caixa Postal 7172, São Paulo, Brazil (T. Borgmeier, W. Kempf, and N. Kusnezov Collections)
Nat. Hist. Mus. London	The Natural History Museum Cromwell Road, London SW7 5BD, England (F. Smith Collection)
Nat. Mus. Nat. Hist. U. S.	National Museum of Natural History 10th and Constitution Avenue NW, Washington, D. C. 20560, USA (T. Pergande and part of W. M. Mann and W. M. Wheeler Collections)
Natural History Museum of Los Angeles County	Exposition Park, 900 Exposition Boulevard Los Angeles, California 90007, USA (Roy Snelling and part of R. E. Gregg Collections)
Naturhist. Mus. Basel	Naturhistorisches Museum Augustinergasse 2, CH-4001 Basel, Switzerland (F. Santschi Collection)
Naturhist. Mus. Wien	Naturhistorisches Museum Wien Burgring 7, A-1014 Wien, Austria (G. Mayr Collection)
Roy. Mus. Stockholm	Naturhistoriska Rikmuseet, Entomologiska Audelningen, Stockholm, Sweden (some W. M. Wheeler types)
Staatliches Museum für Naturkunde	Rosenstein 1, D-70191 Stuttgart, Germany (part of Dominican amber collections)

FIGURE Upper: major. Lower: minor. ARGENTINA: Tucumán (N. Kusnezov). (Type locality: Buenos Aires, Argentina; P. de Strobel). Scale bars = 1 mm.

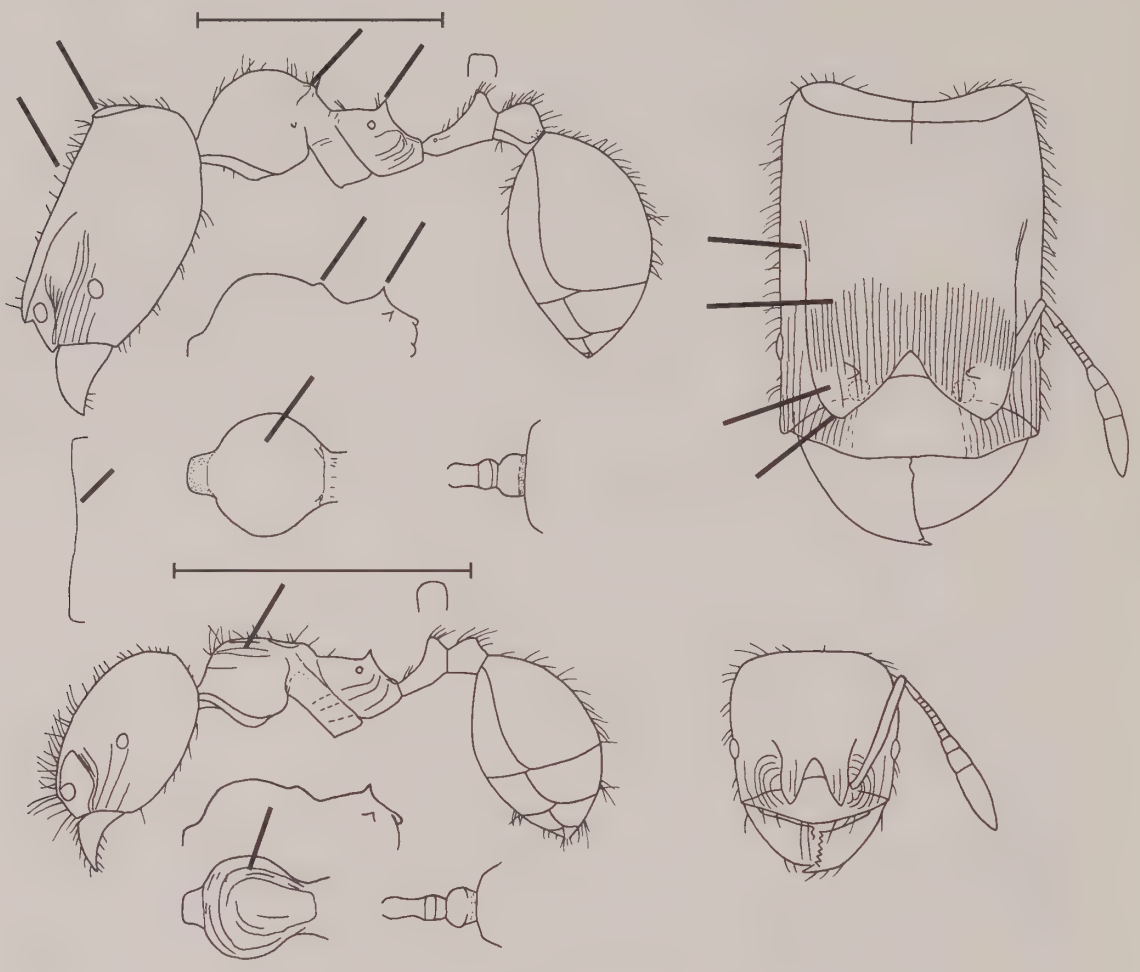


Pheidole aberrans Mayr

Pheidole aberrans Mayr 1868b: 172. Syn.: *Pheidole aberrans* var. *diversiceps* Santschi 1916e: 374, n. syn.; *Pheidole (Elasmopheidole) aberrans* var. *fartilia* Forel 1913m: 233, n. syn.; *Pheidole aberrans* var. *mutica* Emery 1906c: 142, n. syn. Raised to species level in this monograph: *minensis, obscurifrons, weiseri*.

TYPES Naturhist. Mus. Wien.
ETYMOLOGY L *aberrans,* wandering, astray, with possible reference to unusual major head.
DIAGNOSIS A member of the *aberrans* group, closest to *cavifrons, longior,* and *obnixa,* distinguished as follows.
Major: frontal lobes seen from above bilaterally symmetrical, coming to a point an Eye Length from the anterior clypeal border; all of dorsal surface of head carinulate, except for a broad space posterior to the demarcating occipital carina; all pre-carina carinulae turn away (laterad) as they approach the carina; pronotum in dorsal-oblique view very high above smaller but well-developed mesonotal convexity, and semicircular in outline; hypostoma 2-toothed; propodeal spines well developed.
Minor: promesonotal dorsum covered with semicircular carinulae; posterior dorsal surface of head smooth or partially carinulate; propodeal spines well developed.
MEASUREMENTS (mm) Major (Tucumán): HW 1.40, HL 1.64, SL 0.56, EL 0.14, PW 0.86.
Minor (Tucumán): HW 0.68, HL 0.70, SL 0.46, EL 0.10, PW 0.44.
COLOR Major: light reddish brown except for clypeus and edges of frontal lobes, which are plain medium brown.
RANGE Recorded by Kempf (1972b) from Buenos Aires and San Luis provinces of Argentina north to Goiás and Pernambuco states in central Brazil. It has also been collected near Cuzco in Peru, and near Cochabamba, Bolivia (MCZ).
BIOLOGY Bruch (1916) describes typical nests of *aberrans* in San Luis Province, Argentina, as excavated in open ground, comprising a single conspicuous hole, surrounded by a ring of excavated soil, and leading to a succession of flat-bottomed chambers about 5 cm across and up to 2 cm high, which are connected by vertical galleries. Trager (unpublished specimen data) has collected *aberrans* in cactus scrub, overgrazed pasture, a residential backyard, and on roadsides.

FIGURE Upper: lectotype, major (La Sierra, Uruguay). Lower: minor (*"arciruga"* syntype, Rio Grande do Sul, Brazil, compared with *cavifrons* paralectotype). Scale bars = 1 mm.

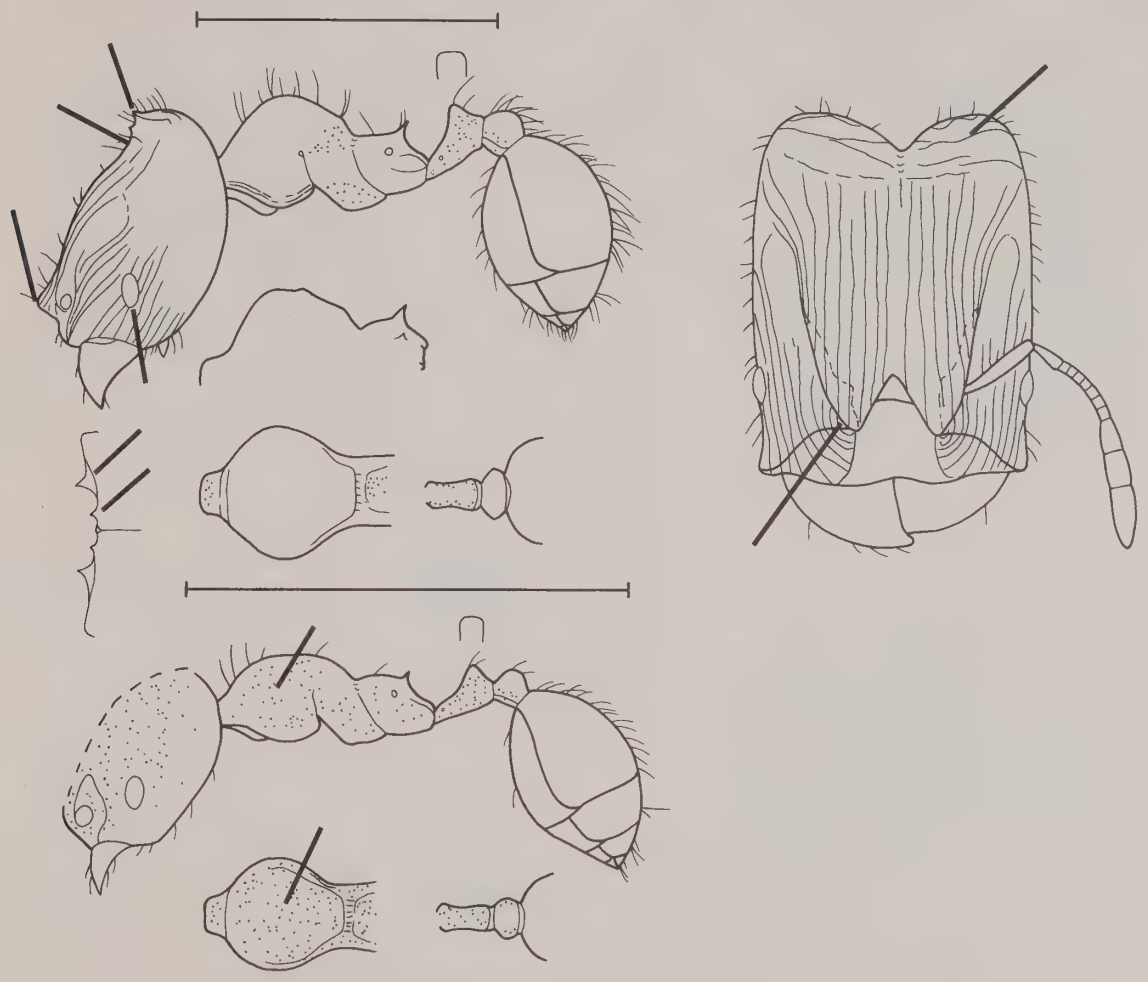


Pheidole cavifrons Emery

Pheidole cavifrons Emery 1906c: 144. Syn.: *Pheidole arciruga* Forel 1908h: 381, n. syn.

TYPES Mus. Civ. Stor. Nat. Genova.
ETYMOLOGY L *cavifrons,* hollow front, evidently referring to the deep antennal scrobes.
DIAGNOSIS Closest to *longior,* somewhat less similar to *aberrans* and *obnixa,* distinguished as follows.
Major: head markedly elongate (Head Length/Head Width 1.39); concolorous yellow; hypostoma toothless; dorsal posterior half of head flat; frontal lobes in full-face view with lobose anterior margins; carinulae originating on frontal lobes end far short of midpoint between eyes and occiput; mesonotal convexity in side view reduced; propodeal spines strongly developed; promesonotum smooth and shiny.
Minor: pronotal dorsum covered by semicircular carinulae.
MEASUREMENTS (mm) Lectotype major: HW 0.76, HL 1.06, SL 0.34, EL 0.06, PW 0.54.
Minor: HW 0.46, HL 0.52, SL 0.34, EL 0.04, PW 0.32.
COLOR Major: concolorous medium yellow.
Minor: concolorous pale yellow.
RANGE Recorded from Buenos Aires, Argentina; Uruguay; and Rio Grande do Sul and Paraná, Brazil.
BIOLOGY The type colony of synonymous *"arciruga"* was collected from a termite mound in Rio Grande do Sul.

FIGURE Upper: holotype, major. Lower: paratype, minor (head partly crushed). TRINIDAD: Maracas Valley (N. A. Weber, May 1936). Scale bars = 1 mm.



Pheidole fracticeps **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *fracticeps,* broken head, from the appearance of the major occiput.

DIAGNOSIS A member of the *aberrans* group closest to the Argentine species *lilloi,* differing from it and other species in the group by the following set of traits.

Major: very small; yellow; hypostoma 4-toothed; in side view, occiput juts out like a brow, with the principal transverse carina (in profile) giving it a sharp edge, and the profile of the head below it dipping away as a strong concavity; in full-face view, occiput bearing the principal demarcating transverse carina plus several others that cross as irregular lines; eye elliptical, placed forward to a little more than an Eye Length from the anterior genal border.

Minor: dorsal surface of head and most of mesosoma and waist foveolate, with a near absence of carinulae overall.

MEASUREMENTS (mm) Holotype major: HW 0.68, HL 0.86, SL 0.30, EL 0.10, PW 0.40.
Paratype minor: HW 0.38, HL 0.44 (approximately), SL 0.34, EL 0.06, PW 0.24.

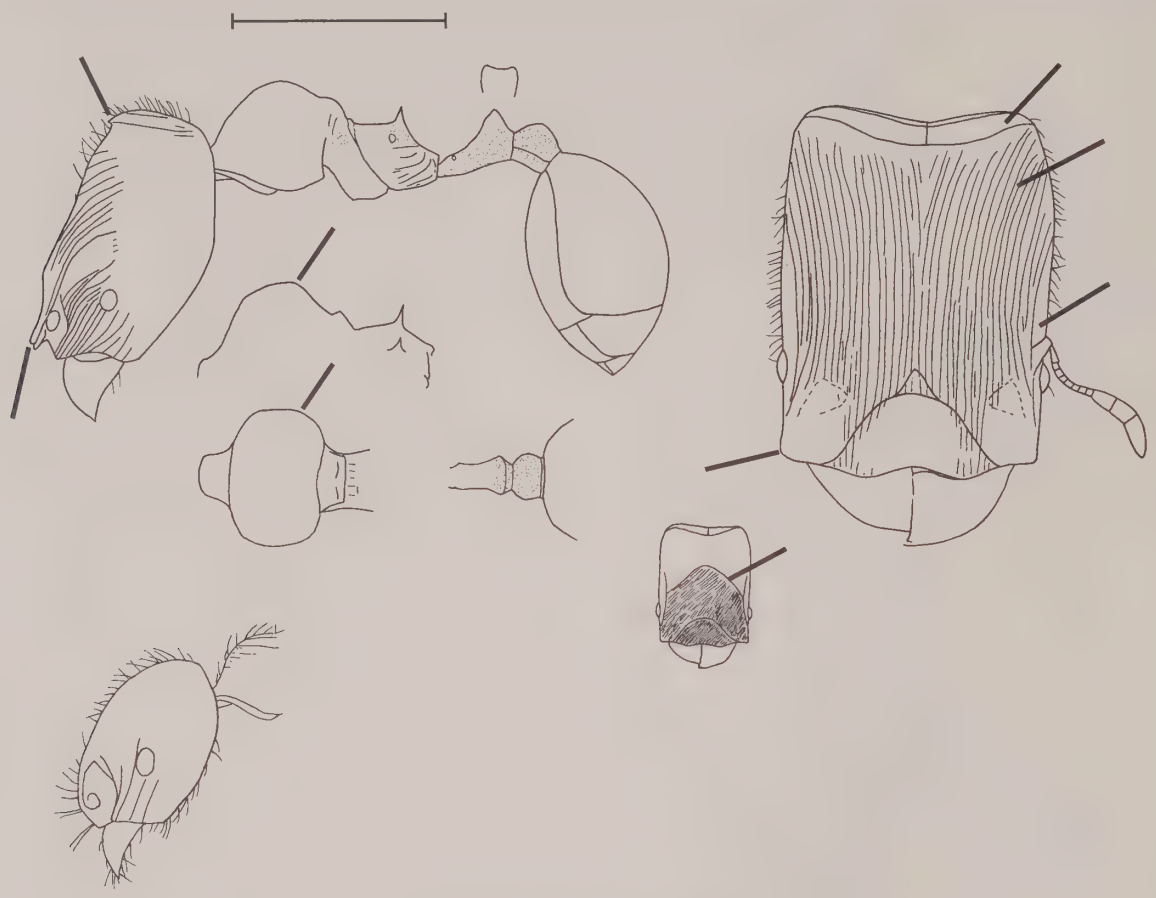
COLOR Major: concolorous medium yellow.
Minor: concolorous yellow.

RANGE Known from the type locality (Trinidad); Yasuni Research Station, Puerto Tiputini, Yasuni National Park, Ecuador; two series from Brazil; and Reserva Mbaracayú, Dept. Canindeyú, Paraguay.

BIOLOGY Probably a rainforest species. The South American specimens were taken variously from leaf litter and soil.

Compare with other members
of the *aberrans* group

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ARGENTINA: Estación Sosa, Entre Rios. Scale bar = 1 mm.

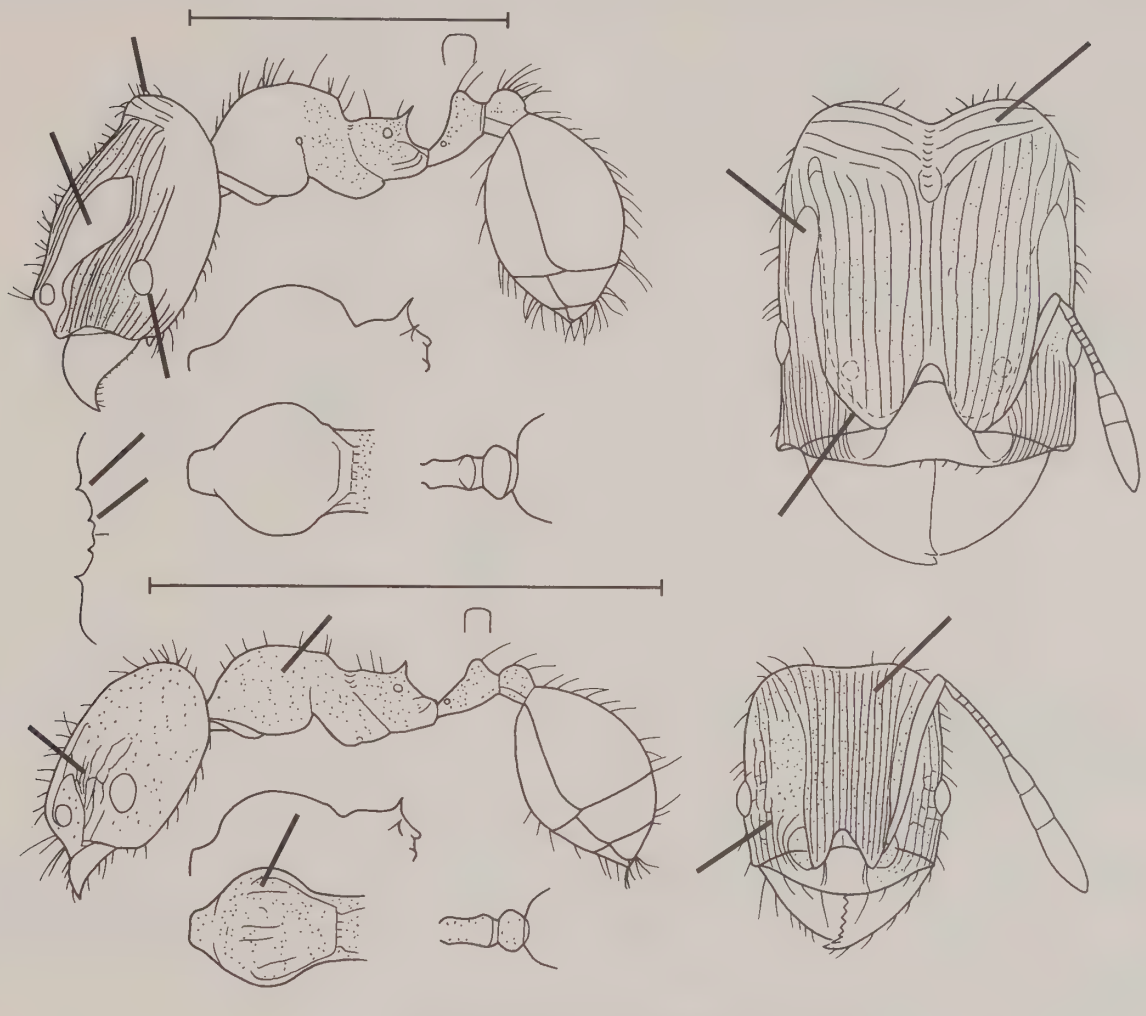


Pheidole laticrista Santschi

Pheidole (Elasmopheidole) laticrista Santschi 1916e: 375.

TYPES Naturhist. Mus. Basel; Mus. Comp. Zool. Harvard.
ETYMOLOGY L *laticrista,* broad ridge, referring to the widely expanded frontal lobes.
DIAGNOSIS **Major**: frontal lobes greatly expanded anteriorly, so that their edges project beyond the lateral head margins in full-face view, and their flat anterior margins just reach the anterior clypeal border; in side view the frontal lobes project downward over the clypeus like thin horns; pronotum greatly enlarged, in dorsal-oblique view 4× higher than the mesonotal convexity, and seen from above more than 2× as wide as the mesonotum; head bicolored (see Color below).
Minor: nearly identical to minor of *cavifrons* (q.v.) except for large eye, as illustrated.
MEASUREMENTS (mm) Lectotype major: HW 0.94, HL 1.28, SL 0.22, EL 0.12, PW 0.66.
Paralectotype minor: HW 0.50, HL 0.56, SL 0.38, EL 0.08, PW 0.34.
COLOR Major: body medium yellow except for anterior dorsal surface of head, which is medium brown.
Minor: concolorous yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ARGENTINA: Tucumán. Scale bars = 1 mm.



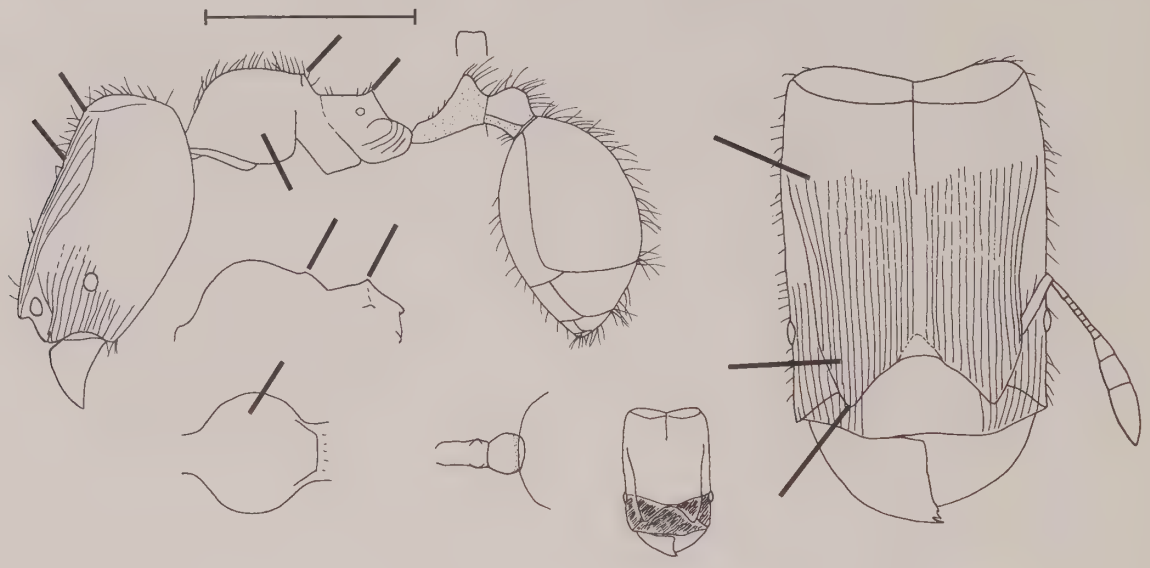
Pheidole lilloi (Kusnezov)

Elasmopheidole lilloi Kusnezov 1952d: 74. Combination in *Pheidole* by Kempf 1972b: 184.

TYPES Inst. Miguel Lillo, Tucumán; Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after Miguel Lillo.
DIAGNOSIS A member of the *aberrans* group closest to *fracticeps,* differing from it and other species of the group by the following combination of traits.
Major: very small; brownish yellow with brown spot on vertex; hypostoma 4-toothed; in side view, occiput projects out like a brow, its apex rounded and the profile of the head below it dipping away as a strong convexity; in full-face view, occiput bearing several widely spaced carinulae that travel from the dorsal midline obliquely toward the occipital corners; eye oval, placed forward to its anterior border is only a little more than an Eye Length from the anterior genal border.
Minor: almost all of head, mesosoma, and waist foveolate; most of dorsal surface of head carinulate, with a rugoreticulum mesad to each eye.
MEASUREMENTS (mm) Lectotype major: HW 0.64, HL 0.84, SL 0.30, EL 0.12, PW 0.40.
Paralectotype minor: HW 0.40, HL 0.44, SL 0.32, EL 0.06, PW 0.24.
COLOR Major: overall brownish yellow, with a light brown spot on the vertex.
Minor: overall brownish yellow except for posterior half of dorsum of head, which is medium brown.
RANGE Recorded from Tucumán and Misiones, Argentina.
BIOLOGY Unknown.

Compare with *aberrans, cavifrons, obnixa*

FIGURE Upper: lectotype, major. ARGENTINA: Loreto, Misiones. The minor is nearly identical to the minor of *cavifrons* (q.v.). Scale bar = 1 mm.



Pheidole longior Santschi, **new status**

Pheidole (Elasmopheidole) cavifrons st. *longior* Santschi 1933f: 110.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY L *longior,* longer, referring to the head shape of the major.
DIAGNOSIS Closest to *cavifrons,* somewhat less similar to *aberrans* and *obnixa,* distinguished as follows.
Major: head markedly elongate (Head Length/Head Width 1.47), and bicolored (see under Color below); dorsal posterior half of head profile flat; frontal lobes in full-face view taper anteriorly into blunt acute angles; carinulae originating on frontal lobes reach well past midpoint between eyes and occiput; mesosomal convexity in side view reduced, obliquely angular; propodeal spines denticulate; promesonotum smooth and shiny.
Minor: nearly identical to minor of *cavifrons* (q.v.).
MEASUREMENTS (mm) Lectotype major: HW 0.72, HL 1.06, SL 0.30, EL 0.06, PW 0.50.
Paralectotype minor: HW 0.50, HL 0.58, SL 0.36, EL 0.04, PW 0.32.
COLOR Major: strikingly bicolored, with anterior fourth of head dark brown, and rest of body medium yellow.
Minor: concolorous light yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Lectotype, major. BRAZIL: Pirapora, Minas Gerais. Minor unknown.

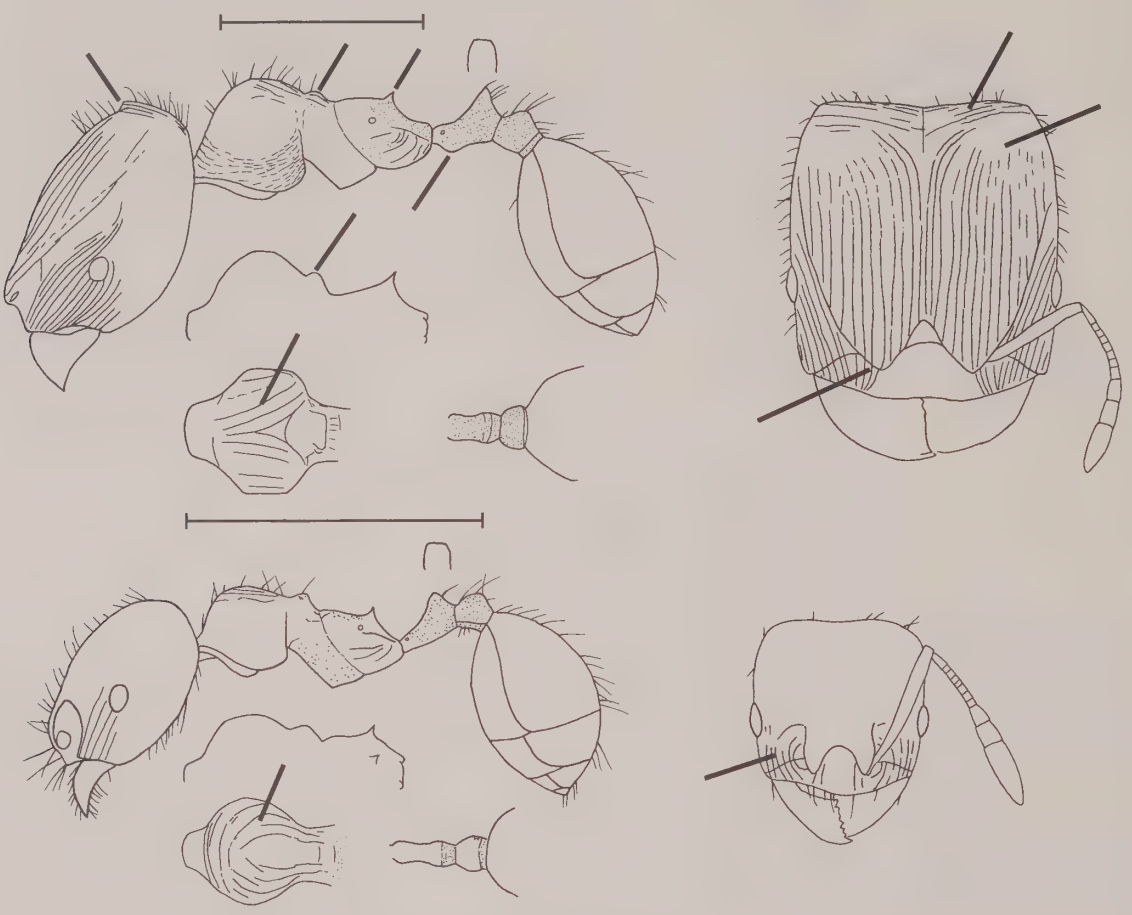
Pheidole minensis Santschi, **new status**

Pheidole (Elasmopheidole) aberrans var. *minensis* Santschi 1923d: 64.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY Named after the Brazilian state of origin.
DIAGNOSIS **Major**: reddish yellow; frontal lobes very broad, in full-face view spread laterally almost to the margins of the head, and their smoothly lobose anterior edges just reaching the anterior margin of the clypeus; except for the frontal triangle, the entire dorsal surface of the head carinulate; transverse carinulae originating on each corner of the occiput dip obliquely to meet at the midline of the head, reaching anteriorly to nearly halfway to the eye level.
Minor: unknown.
MEASUREMENTS (mm) Lectotype major: HW 1.58, HL 2.00, SL 0.60, EL 0.20, PW 0.94.
COLOR Concolorous reddish yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *aberrans, cavifrons, longior*

FIGURE Upper: paralectotype, major (Rosario de Santa Fé, Argentina; only tentatively associated with lectotype minor). Lower: lectotype, minor (Buenos Aires, Argentina). Scale bars = 1 mm.

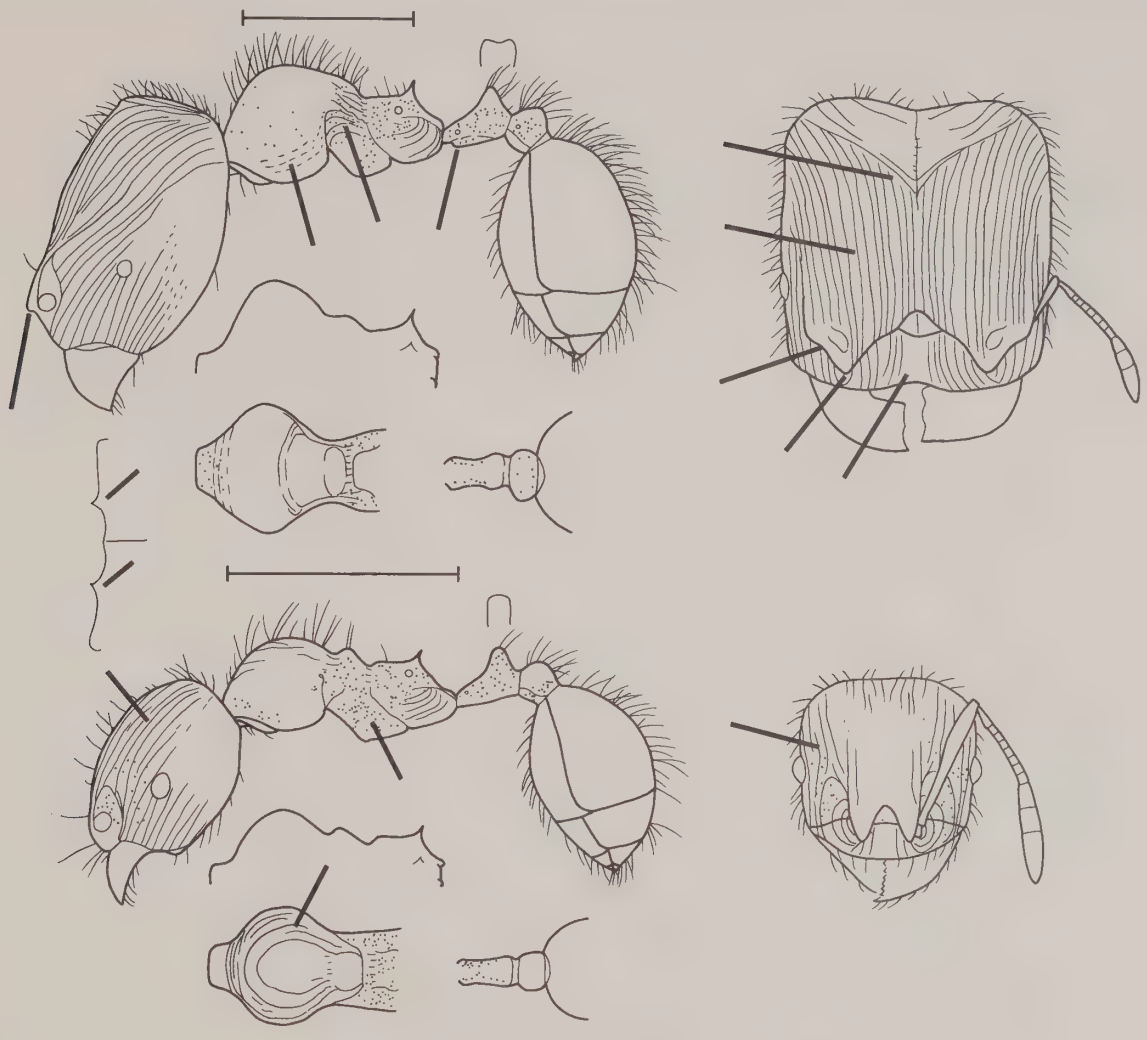


Pheidole obnixa Forel

Pheidole arciruga r. *obnixa* Forel 1913m: 231. Raised to species level by Santschi 1925e: 157.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY L *obnixa,* steadfast, resolute, allusion unknown.
DIAGNOSIS Similar to *aberrans, cavifrons,* and *longior,* distinguished as follows.
Major: head comparatively short (Head Length/Head Width 1.2 mm, the same as *aberrans,* much shorter than *cavifrons* and *longior*); pronotal dorsum covered by widely spaced longitudinal carinulae, with those near the midline curving outward toward the rear; occiput covered by transverse carinulae; humerus, mesonotal convexity, and propodeal spines well developed; a low lobe present on profile of postpetiolar venter.
Minor: pronotum covered by semicircular carinulae.
MEASUREMENTS (mm) Paralectotype major (Rosario de Santa Fé, Argentina): HW 1.20, HL 1.34, SL 0.50, EL 0.14, PW 0.60. Lectotype minor (Buenos Aires): HW 0.52, HL 0.54, SL 0.40, EL 0.08, PW 0.34.
COLOR Major: concolorous light brown.
Minor: mesosomal waist yellowish brown, head and gaster light brown.
RANGE Buenos Aires, Córdoba, and Santa Fé, in Argentina.
BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ARGENTINA: Fives Lille, Santa Fé. Scale bars = 1 mm.



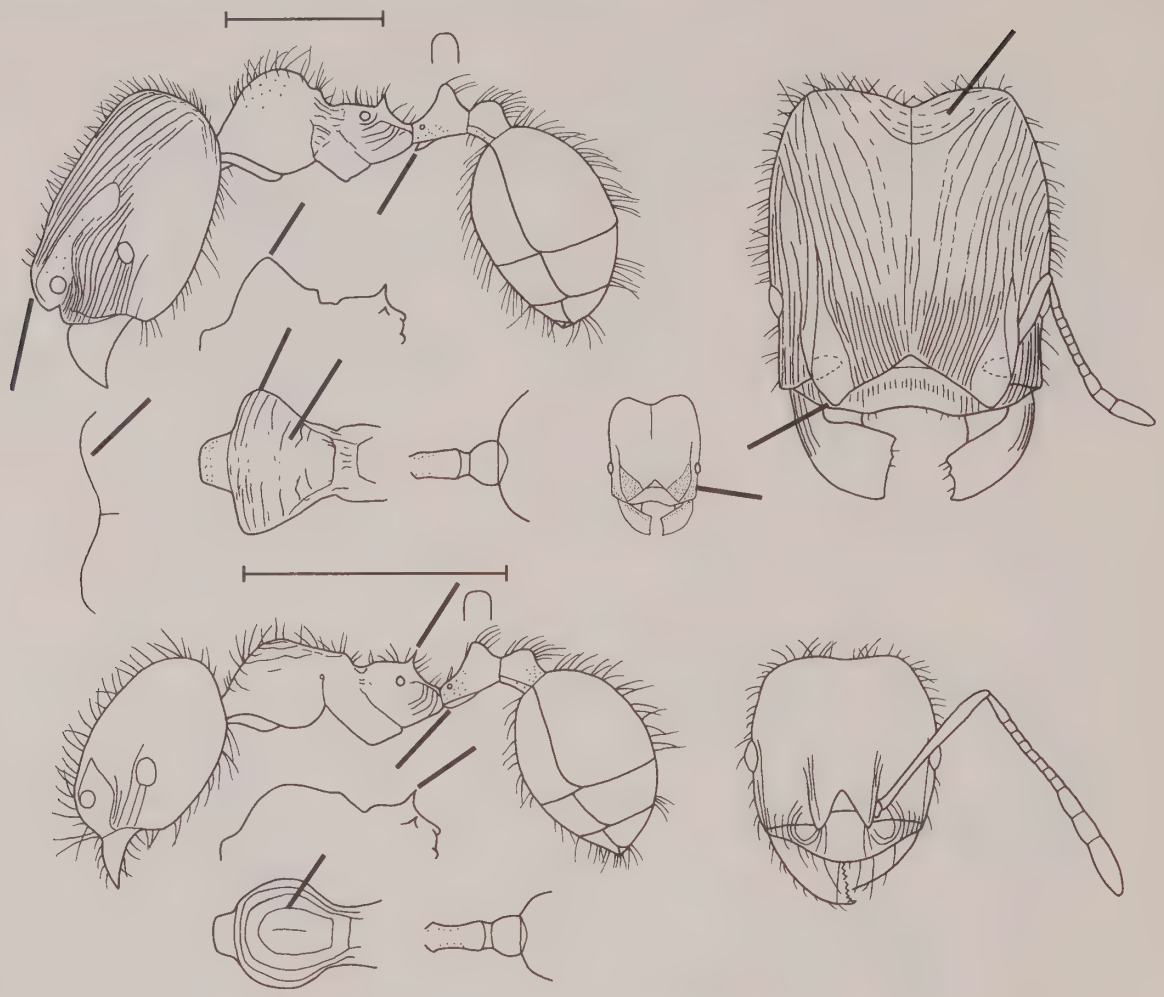
Pheidole obscurifrons Santschi, **new status**

Pheidole (Elasmopheidole) aberrans var. *obscurifrons* Santschi 1925e: 158.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY L *obscurifrons,* dark or indistinct brown, allusion unknown.
DIAGNOSIS **Major**: large; yellow; frontal lobes in side view form blunt right angles; in full-face view the mesad anterior border is straight and the lateral anterior border concave, the two coming together as a blunt angle that approaches within an Eye Length of the anterior clypeal border; all of the dorsal surface of the head carinulate except the centers of the clypeus and occiput; upper section of mesopleuron carinulate and foveolate; low, forward-directed process present on postpetiolar venter.
Minor: all of dorsum and sides of head except vertex and frontal triangle carinulate; pronotal dorsum covered by semicircular carinulae; mesopleuron foveolate.
MEASUREMENTS (mm) Lectotype major: HW 1.70, HL 2.00, SL 0.62, EL 0.16, PW 0.90.
Paralectotype minor: HW 0.76, HL 0.82, SL 0.62, EL 0.10, PW 0.50.
COLOR Major: concolorous reddish brown.
Minor: concolorous plain yellow.
RANGE Recorded from Santa Fé and Córdoba, Argentina (Kempf 1972b).
BIOLOGY Unknown.

Compare with other members
of the *aberrans* group

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. Scale bars = 1 mm.

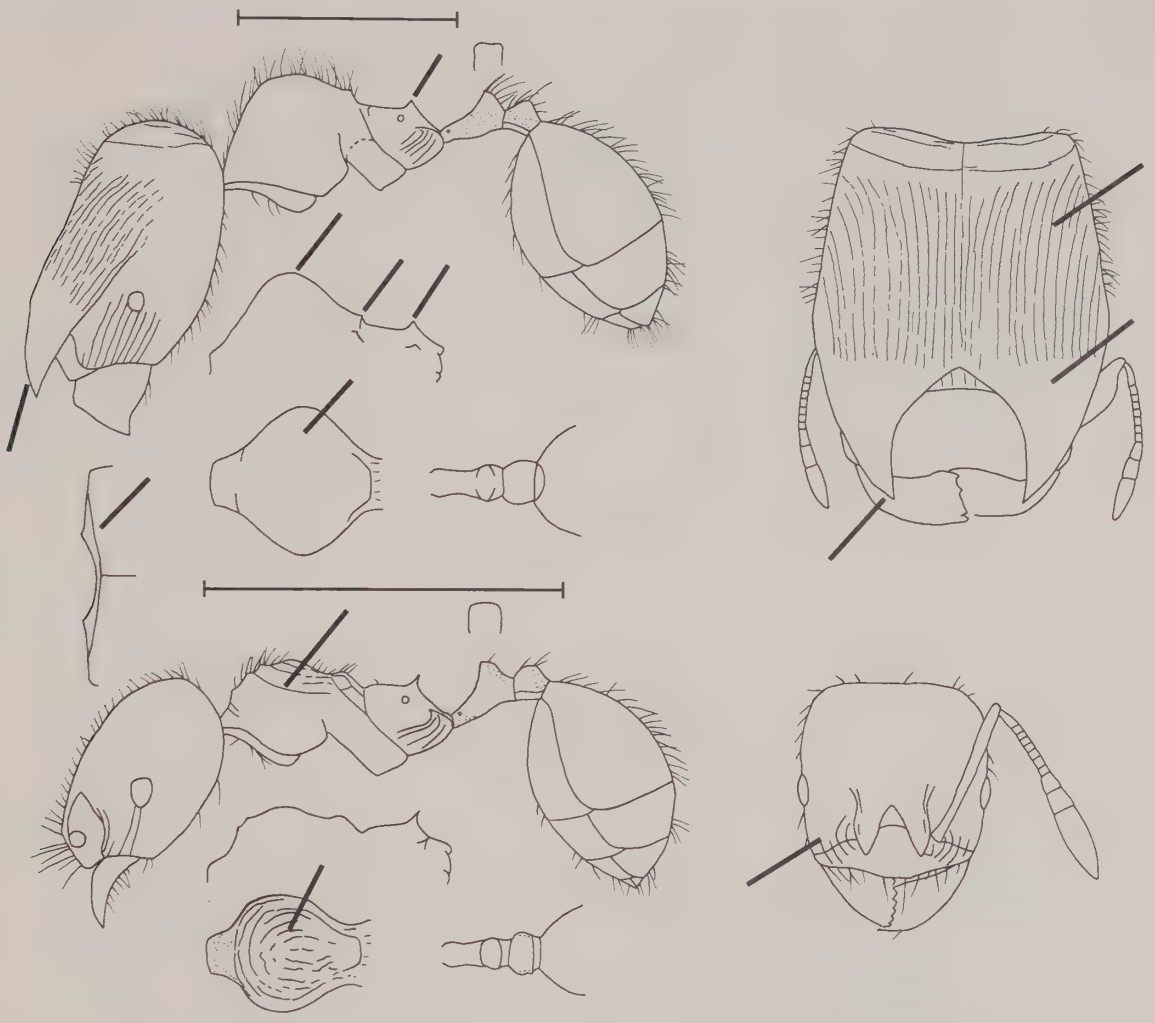


Pheidole subaberrans (Kusnezov)

Elasmopheidole subaberrans Kusnezov 1952d: 71. Combination in *Pheidole* by Kempf 1972b: 184.

TYPES Inst. Miguel Lillo, Tucumán; Mus. Comp. Zool. Harvard.
ETYMOLOGY L *subaberrans,* below, i.e., almost *aberrans*.
DIAGNOSIS A member of the *aberrans* group—actually, an intermediate in habitus between the *aberrans* and *tristis* groups—distinguished as follows.
Major: large; head bicolored; occipital carina not present as in other *aberrans*-group species; hypostoma lacking spines; in full-face view, frontal lobes broad, asymmetrical, with pointed anterior borders that just reach the anterior clypeal border; humeri very large, rising 4× higher than the mesonotal convexity in dorsal-oblique view; acute, forward-projecting process on postpetiolar venter, as seen from the side; pronotum partly covered by transverse carinulae.
Minor: low process present on venter of postpetiole, as seen from the side; semicircular carinulae cover the pronotum; propodeal spines thin, needle-like.
MEASUREMENTS (mm) Lectotype major: HW 1.44, HL 1.76, SL 0.60, EL 0.16, PW 0.86.
Paralectotype minor: HW 0.64, HL 0.68, SL 0.54, EL 0.12, PW 0.44.
COLOR Major: reddish yellow except for frontal lobes and borders of mandibles, which are a sharply contrasting blackish brown.
RANGE Recorded from Tucumán and Salta, Argentina.
BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ARGENTINA: Santa Catalina, Buenos Aires. Scale bars = 1 mm.



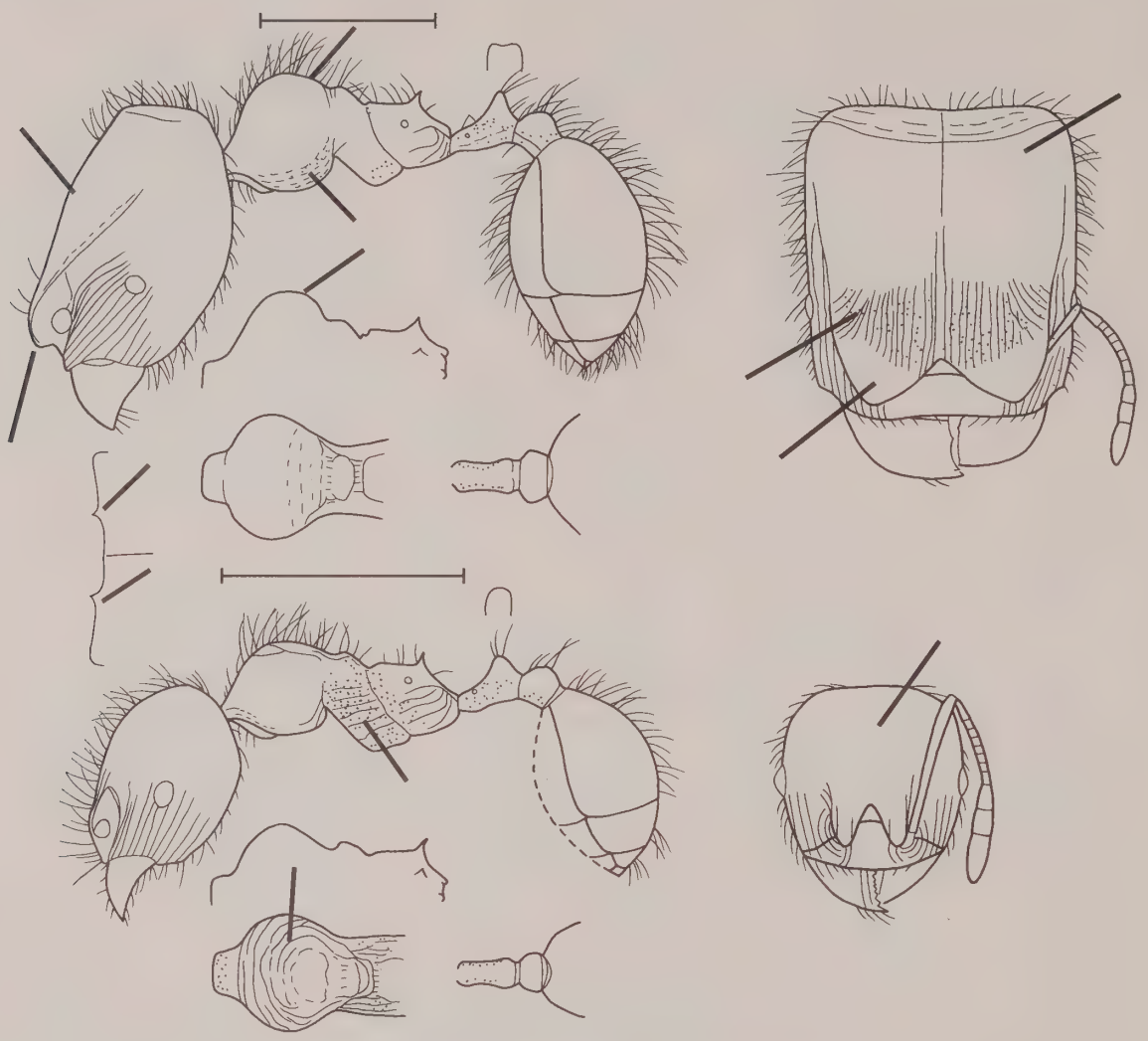
Pheidole taurus Emery

Pheidole taurus Emery 1906c: 142.

TYPES Mus. Civ. Stor. Nat. Genova.
ETYMOLOGY Gr *taurus,* bull, alluding to the horn-like frontal lobes of the major.
DIAGNOSIS The most distinctive member of the *aberrans* group and one of the most unusual *Pheidole* species.
Major: frontal lobes drawn out into sharp, downward- and inward-curving horn-like extensions that reach beyond the clypeus to overhang the bases of the mandibles; laterally the edges of the frontal lobes extend past the margins of the head; bicolorous (see Color below); carinulae of head confined to a broad band from the level of the frontal triangle to the transverse carina that delimits the beginning of the occiput.
Minor: promesonotal dorsum covered by semicircular carinae; carinulae on head mostly limited to antennal fossae and clypeus.
MEASUREMENTS (mm) Lectotype major: HW 1.08, HL 1.24, SL 0.42, EL 0.10, PW 0.66.
Paralectotype minor: HW 0.48, HL 0.56, SL 0.42, EL 0.08, PW 0.34.
COLOR Major: concolorous reddish yellow, including midclypeus, but "horns" (extended frontal lobes), together with the frontal triangle and vertex, are dark brown, forming a "mask" over anterior dorsal surface of the head.
RANGE Buenos Aires and Santa Fé, Argentina (Kempf 1972b).
BIOLOGY Unknown.

Compare with *minensis, obscurifrons*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ARGENTINA: Pucapampa, near Santa Catalina, Jujuy. Scale bars = 1 mm.

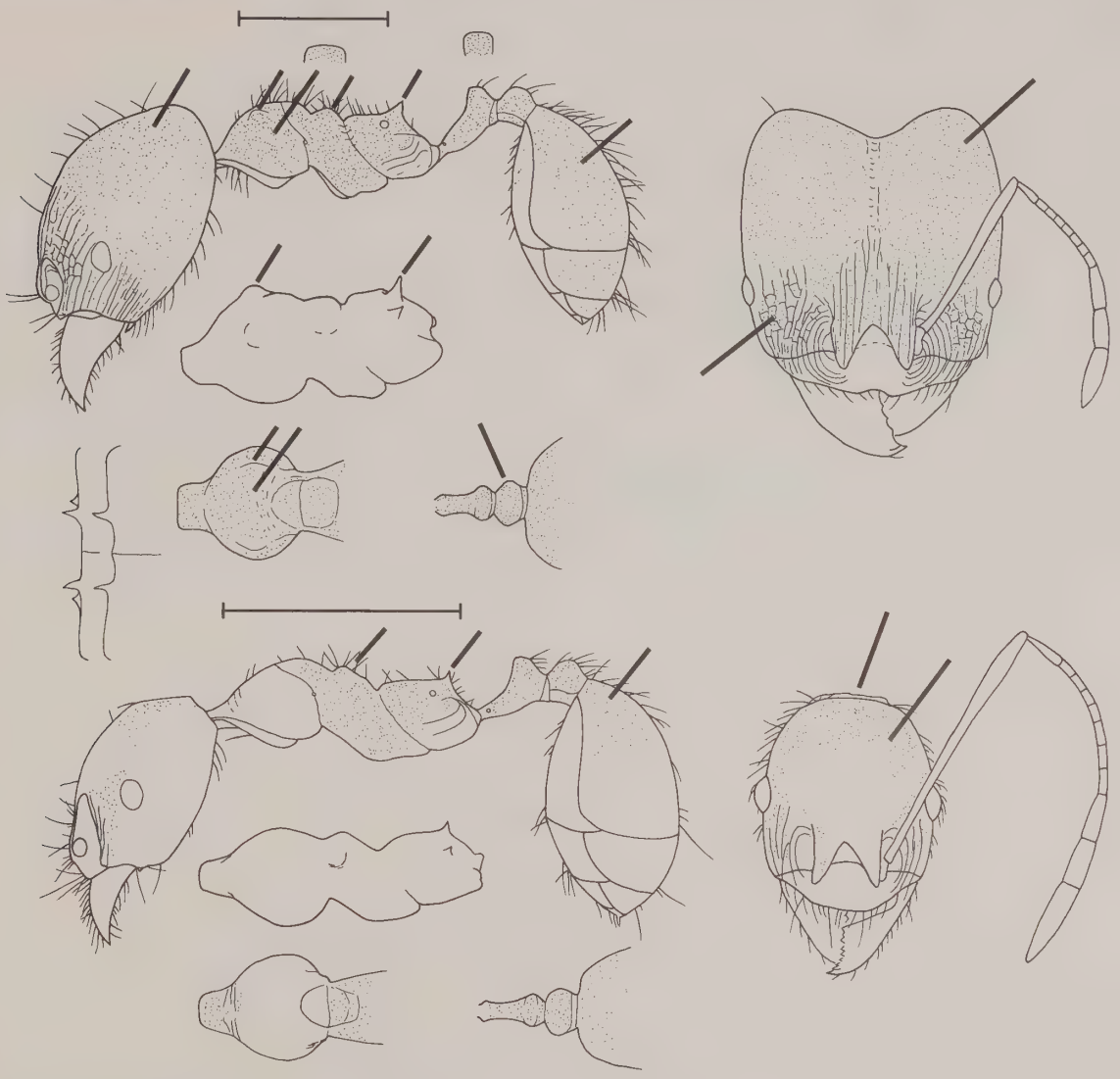


Pheidole weiseri Santschi, **new status**

Pheidole (Elasmopheidole) aberrans st. *weiseri* Santschi 1923d: 64.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY Eponymous.
DIAGNOSIS A member of the *aberrans* group, closest to *minensis* and *obscurifrons*.
Major: light yellow; frontal lobes seen from the side form prominent lobes that only partly overhang the clypeus; seen from above, the lobes are broad, and subangular at their anterior tips, which extend to within an Eye Length of the anterior clypeal border; tips of frontal lobes smooth, which surfaces are succeeded posteriorly by a broad band of carinulae, and this gives way at eye level to a smooth area that extends all the way to the occiput; pronotal profile semicircular; faint carinulae line the lower pronotal margin.
Minor: pronotum covered by semicircular carinulae, and mesopleuron by foveolae and longitudinal carinulae.
MEASUREMENTS (mm) Lectotype major: HW 1.42, HL 1.64, SL 0.58, EL 0.18, PW 0.84.
Paralectotype minor: HW 0.80, HL 0.80, SL 0.58, EL 0.12, PW 0.48.
COLOR Major: concolorous light reddish yellow.
Minor: body light brown, appendages brownish yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: lectotype, major (with 2 hypostomal teeth; a 4-toothed variant is also shown). Lower: paralectotype, minor. COLOMBIA: Bogotá. Scale bars = 1 mm.



Pheidole biconstricta Mayr

Pheidole biconstricta Mayr 1870a: 399. Syn.: *Pheidole biconstricta* subsp. *bicolor* Emery 1890c: 50, n. syn.; *Pheidole biconstricta* r. *rubicunda* Emery 1890c: 50, n. syn.; *Pheidole biconstricta rubicunda* var. *fuscata* Emery 1890c: 51 (unavailable name, quadrinomial); *Pheidole biconstricta* subsp. *hybrida* Emery 1894d: 154, n. syn.; *Pheidole radoszkowskii* r. *lallemandi* Forel 1901d: 133, n. syn.; *Pheidole biconstricta bicolor* var. *regina* Forel 1908c: 52, n. syn.; *biconstricta hybrida* var. *angustella* Forel 1912g: 222 (unavailable name, quadrinomial); *Pheidole biconstricta* var. *surda* Forel 1912g: 222, n. syn; *Pheidole biconstricta* subsp. *burtoni* Mann 1916: 436, n. syn. (provisional); *Pheidole holmgreni* Wheeler 1925a: 18, n. syn.; *Pheidole holmgreni festata* Wheeler 1925a: 20, n. syn. I have examined the types of all the above listed forms that are available nomenclaturally. What I have regarded here as the single species *biconstricta* is highly variable in details of size, sculpturing, and color, both locally and geographically, with general and overlapping intergradation. Closer studies with more material may well reveal *biconstricta* to be a complex of sibling species, to which at least some of the names will apply, but for the time being I have chosen the more conservative arrangement, that is, recognition of a single, very variable species.

TYPES Naturhist. Mus. Wien.
ETYMOLOGY L *biconstricta,* constricted (pinched) twice, once in front of the mesonotum and once behind it.
DIAGNOSIS A member of the *biconstricta* group distinguished as follows.
Major: large, with well-developed propodeal spines and prominent rounded humeral angles; head dorsal surface foveolate, space between eye and antennal fossa rugoreticulate; first 2 gastral tergites mostly shagreened and opaque; pilosity sparse on head, moderate on rest of body; body color reddish yellow ("orange") to dark reddish brown, usually a lighter shade; one variant (*"bicolor,"* possibly a distinct species) has a contrasting paler gaster.

Minor: head conspicuously narrowed, with nuchal collar; mesonotal convexity well-developed, leaning forward; propodeal spines short, thick, and erect; occiput, mesothorax, and propodeum foveolate and opaque; anterior half of first gastral tergite shagreened and opaque.

MEASUREMENTS (mm) Lectotype major: HW 1.62, HL 1.70, SL 1.08, EL 0.22, PW 0.82.
Paralectotype minor: HW 0.78, HL 0.94, SL 1.12, EL 0.16, PW 0.54.

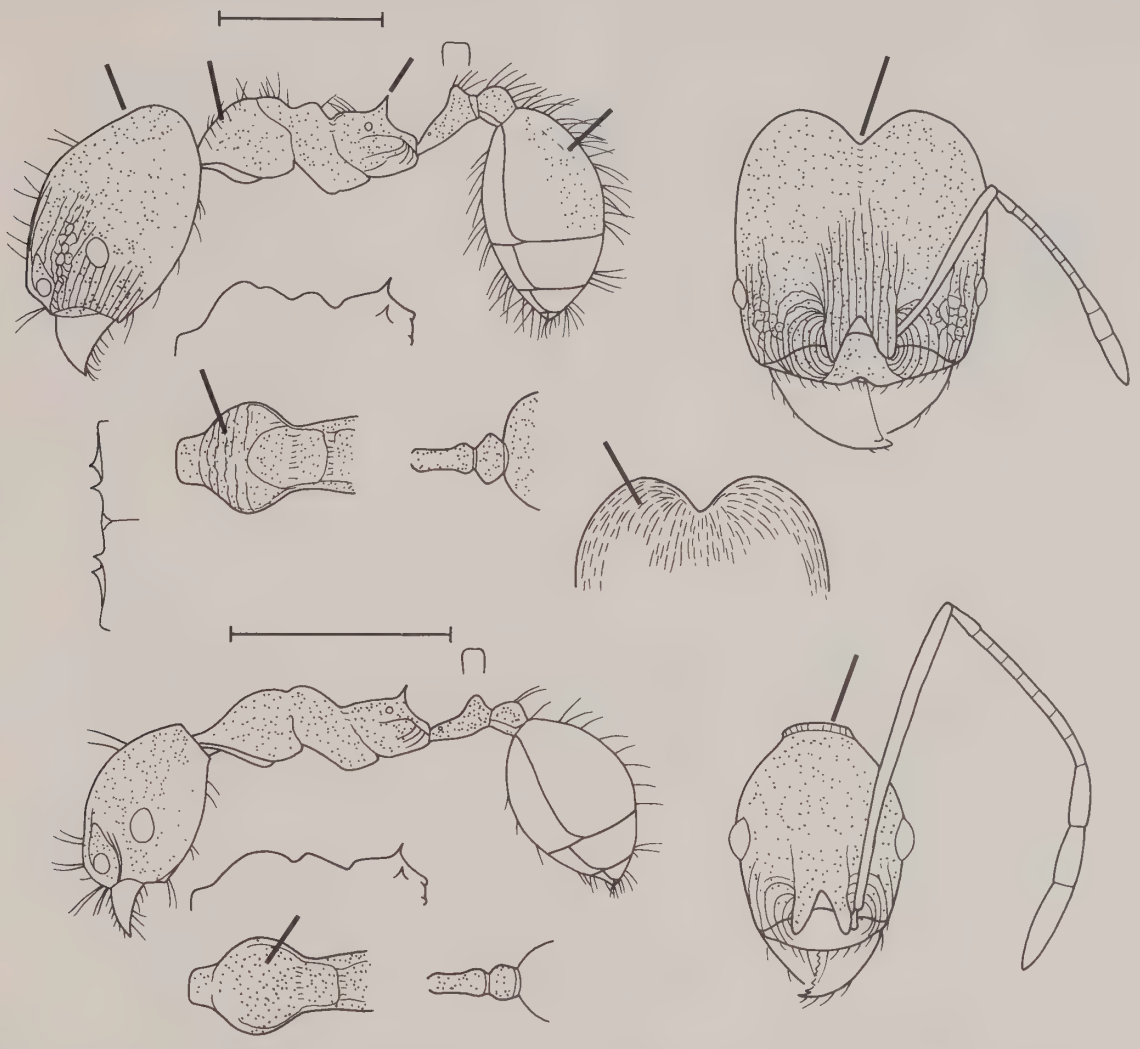
COLOR Major: yellowish brown (possibly faded).
Minor: light reddish brown; otherwise, see Diagnosis above.

RANGE Widespread and locally abundant, occurring mostly in tropical moist forests from Guatemala to Brazil and Bolivia; present in Trinidad but absent from Tobago and the rest of the West Indies. Ranges to at least 1500 m in Costa Rica and to 2500 m in Colombia.

BIOLOGY *P. biconstricta* is a conspicuous ant in much of the tropical forests of the New World. It forms large colonies, with populations possibly in the tens of thousands, that nest in rotting logs and stumps on the forest floor. John T. Longino (1997) reports that in Costa Rica, "Workers are aggressive, and forage day or night. Large numbers of minor and major workers may be observed swarming out from nests and retrieving live insect prey, with a behavior reminiscent of army ants. Workers also tend Homoptera, and visit extrafloral nectar sources. Colonies may build scattered carton shelters on low vegetation, and tend membracids and other Homoptera beneath them. Workers may aggressively defend extrafloral nectar sources (e.g. *Passiflora* shoots), driving away herbivores and other ants. Colonies use carton construction to form baffles in rotten wood, and galleries running up tree trunks. At Rara Avis, workers were observed tending large riodinid larvae under carton galleries. Founding queens are found under loose bark of dead wood, in dead branches, and very commonly under epiphyte mats on recently fallen trees."

Charles Kugler (1979d) has described the capture of live insect prey by "gang-pulling, and the hypertrophial pygidial glands, which secrete a viscous gumming agent and irritant when smeared on enemies. Another behavior unusual for *Pheidole* is the lifting of the gaster toward the enemy, making release of the toxin material more effective. Alarm pheromones also emanate from the same gland."

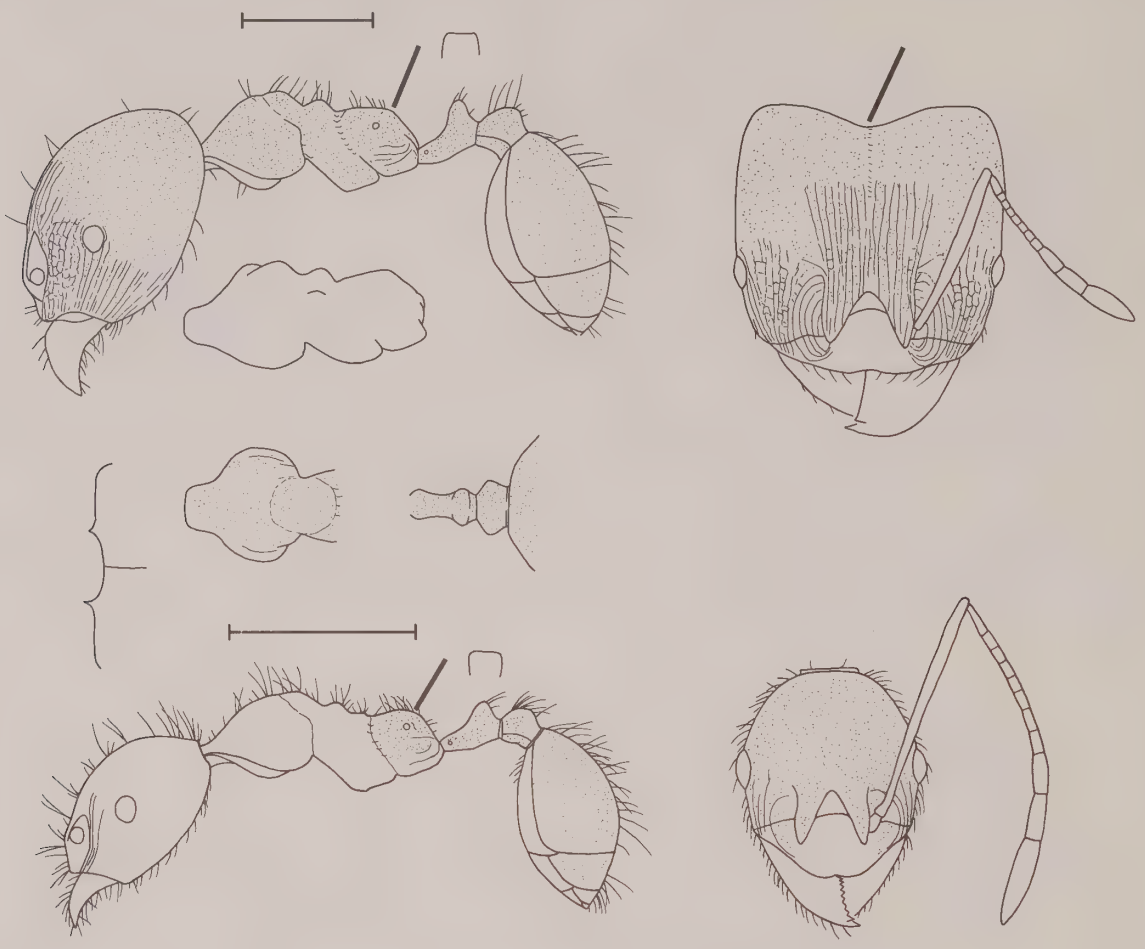
FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Estácion Biologia de Cocha Cashu, Madre de Dios Prov., 400 m (Diane W. Davidson). Scale bars = 1 mm.



Pheidole fissiceps **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *fissiceps,* cleft head, referring to the deep median occipital cleft.
DIAGNOSIS A member of the *biconstricta* group, similar to *biconstricta, plato, simplex*, and *socrates,* easily distinguished as follows.
Major: deep midoccipital cleft; large propodeal spines; flat profile posterior dorsal surface of the head; aligned appressed pilosity of the dorsal head surface; transversely carinulate pronotal dorsum.
Minor: tapered occiput with well-developed occipital collar.
MEASUREMENTS (mm) Holotype major: HW 1.56, HL 1.70, SL 1.18, EL 0.22, PW 0.74.
Paratype minor: HW 0.58, HL 0.78, SL 1.06, EL 0.16, PW 0.40.
COLOR Major and minor: concolorous yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. MEXICO (no further data; Edward Norton, 1860s). Scale bars = 1 mm.

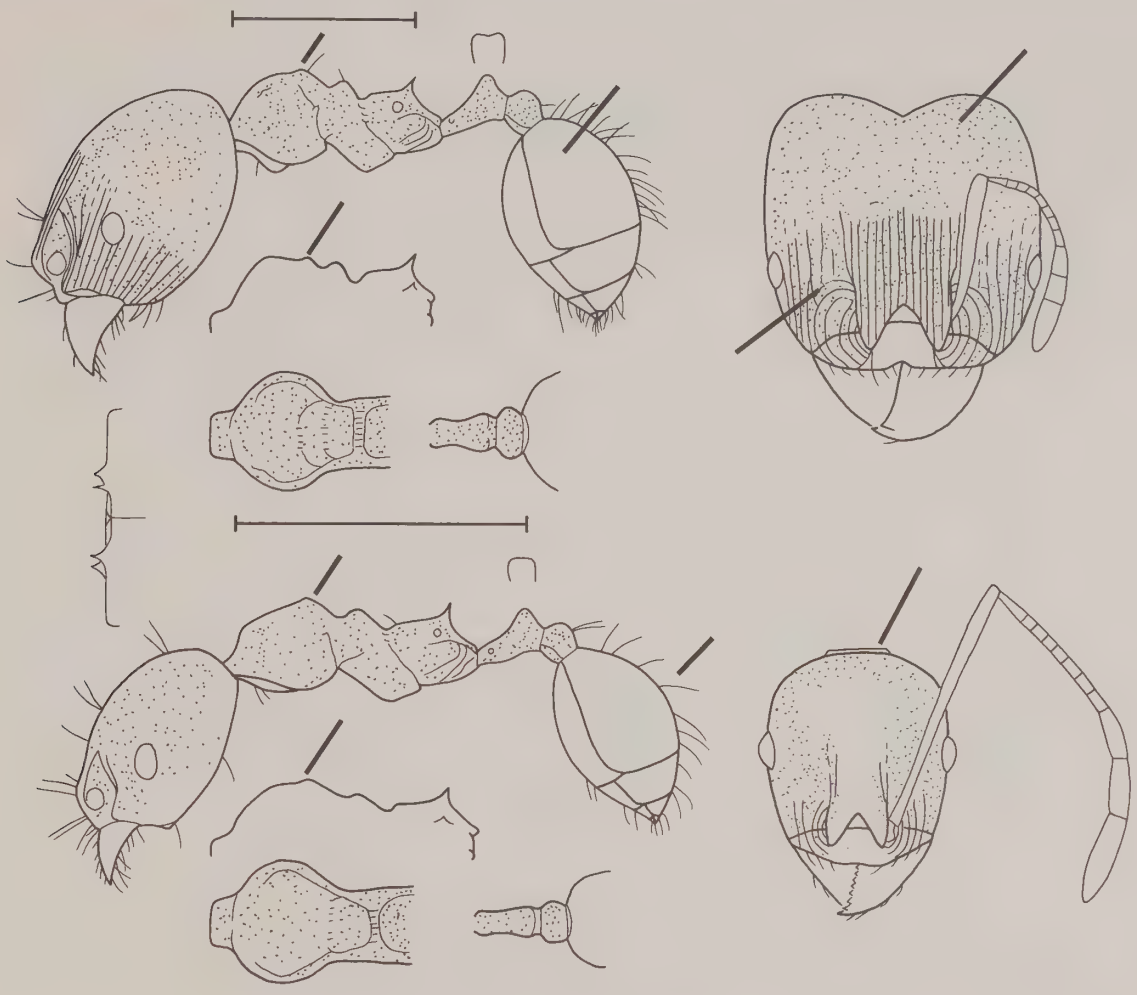


Pheidole inermis Mayr

Pheidole inermis Mayr 1870b: 984.

TYPES Naturhist. Mus. Wien.
ETYMOLOGY L *inermis,* unarmed, referring to the absence of propodeal spines.
DIAGNOSIS Distinguished from all other members of the *biconstricta* group and most of *Pheidole* species by the absence of propodeal spines in the **major** and **minor**. In full-face view, occipital cleft of **major** relatively shallow, occipital lobes tending toward subangulate.
MEASUREMENTS (mm) Lectotype major: HW 1.84, HL 1.72, SL 1.06, EL 0.24, PW 0.84.
Paralectotype minor: HW 0.80, HL 0.94, SL 1.10, EL 0.14, PW 0.54.
COLOR Major: most of body light reddish brown, with mandibles, postpetiole, and gaster medium reddish brown.
Minor: gaster medium brown, rest of body light reddish brown.
RANGE I have verified series of *inermis* from Veracruz, Mexico (Cuichapa, 1600 m); Honduras (Mina El Mochito, Santa Barbara, 1040 m; Lago Yojoa, Cortes, 700 m); and Nicaragua (Matagalpa, 1200+ m).
BIOLOGY The species has been collected in montane forest, in one case (Mina El Mochito, Honduras) from rotting wood.

FIGURE Upper: holotype, major. Lower: paratype, minor. ECUADOR: 22 km southwest of Puyo, Pastaza Prov. (Stewart B. and Jarmila Kukalová-Peck). Scale bars = 1 mm.

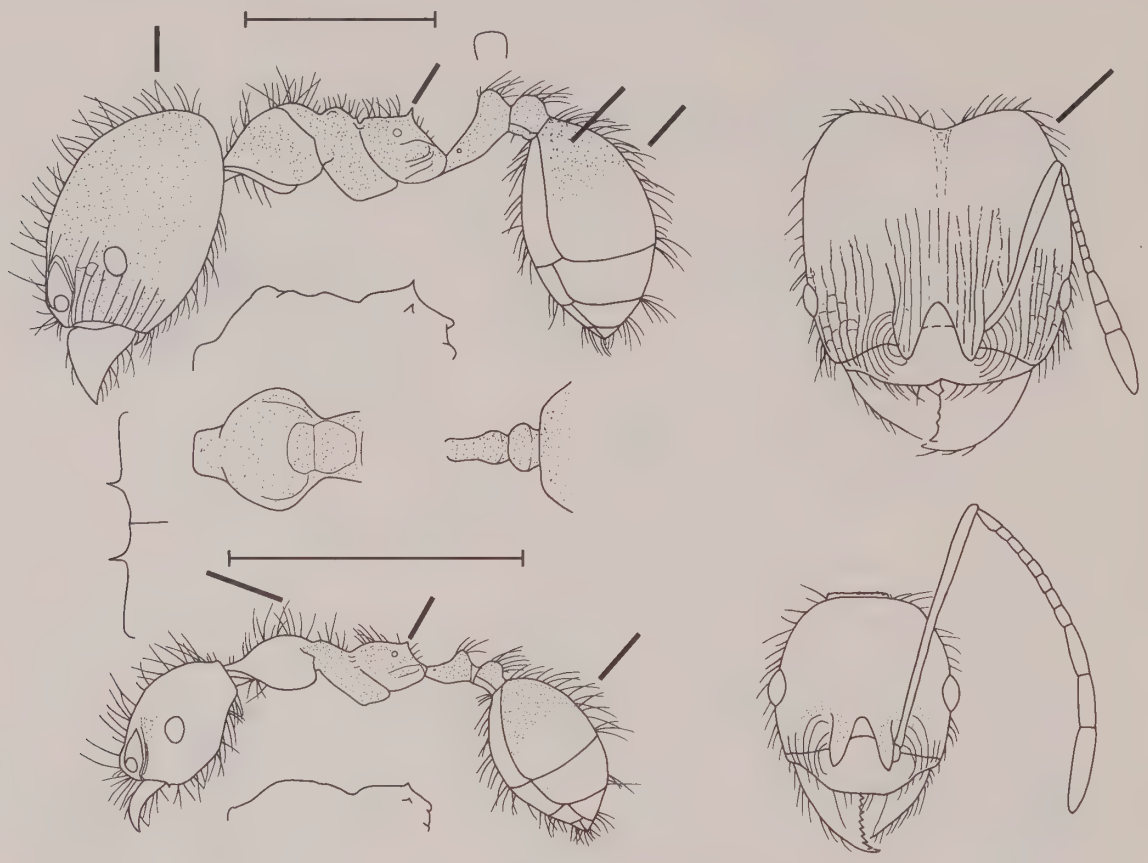


Pheidole plato **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY For the philosopher, chosen to set it off from the related species *socrates*.
DIAGNOSIS Similar to *biconstricta* and *socrates*.
Major and **minor**: first gastral tergite smooth and shiny; in side and dorsal-oblique view, profile of posterior half of pronotal dorsum raised as a low subangular prominence; color distinctive (see below); pilosity very sparse.
Major: only a small trace of rugoreticulum present between eye and antennal fossa and located close to the fossa.
Minor: relatively broad occipital border in full-face view.
MEASUREMENTS (mm) Holotype major: HW 1.44, HL 1.44, SL 0.84, EL 0.20, PW 0.66.
Paratype minor: HW 0.54, HL 0.64, SL 0.80, EL 0.14, PW 0.40.
COLOR Major: body and mandibles light yellowish brown, other appendages dark yellow.
Minor: body medium brown, appendages light brown.
RANGE Known only from the type series.
BIOLOGY Unknown.

Compare with other members of the *biconstricta* group

FIGURE Upper: lectotype, major (PERU: "Llinquipata"). Lower: minor (BRAZIL: Aleixo, near Manaus), compared with paralectotype from type locality. Scale bars = 1 mm.

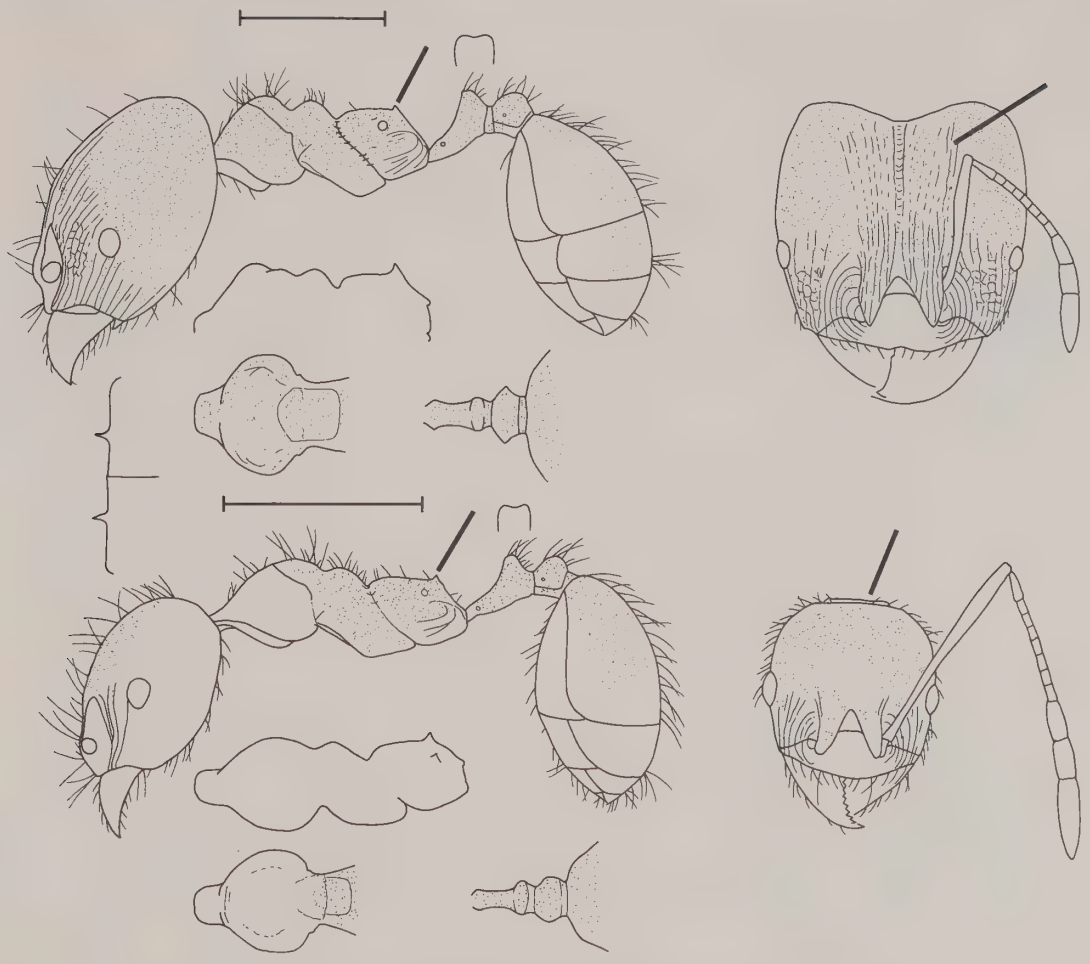


Pheidole simplex Wheeler, **new status**

Pheidole biconstricta simplex Wheeler 1925a: 21.

TYPES Roy. Mus. Stockholm; Mus. Comp. Zool. Harvard.
ETYMOLOGY L *simplex,* simple, anatomical reference unknown.
DIAGNOSIS Distinguished from other members of the *biconstricta* group by the dense, long, suberect to erect pilosity and reduced propodeal spines in both the **major** and **minor** castes. Also, only the anterior half of the first gastral tergite is shagreened and opaque.
MEASUREMENTS (mm) Lectotype major: HW 1.42, HL 1.36, SL 0.92, EL 0.16, PW 0.68.
Paralectotype minor (Aleixo, Brazil): HW 0.64, HL 0.74, SL 0.90, EL 0.14, PW 0.44.
COLOR Major and minor: yellowish red, with gaster of minor a slightly contrasting brownish yellow.
RANGE Poorly known; records are from Amazonian Brazil and Peru.
BIOLOGY At Cuzco Amazónico, near Puerto Maldonado, Peru, Stefan Cover and John E. Tobin found a colony in terra firme forest, nesting in a rotten log.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Belém. Scale bars = 1 mm.

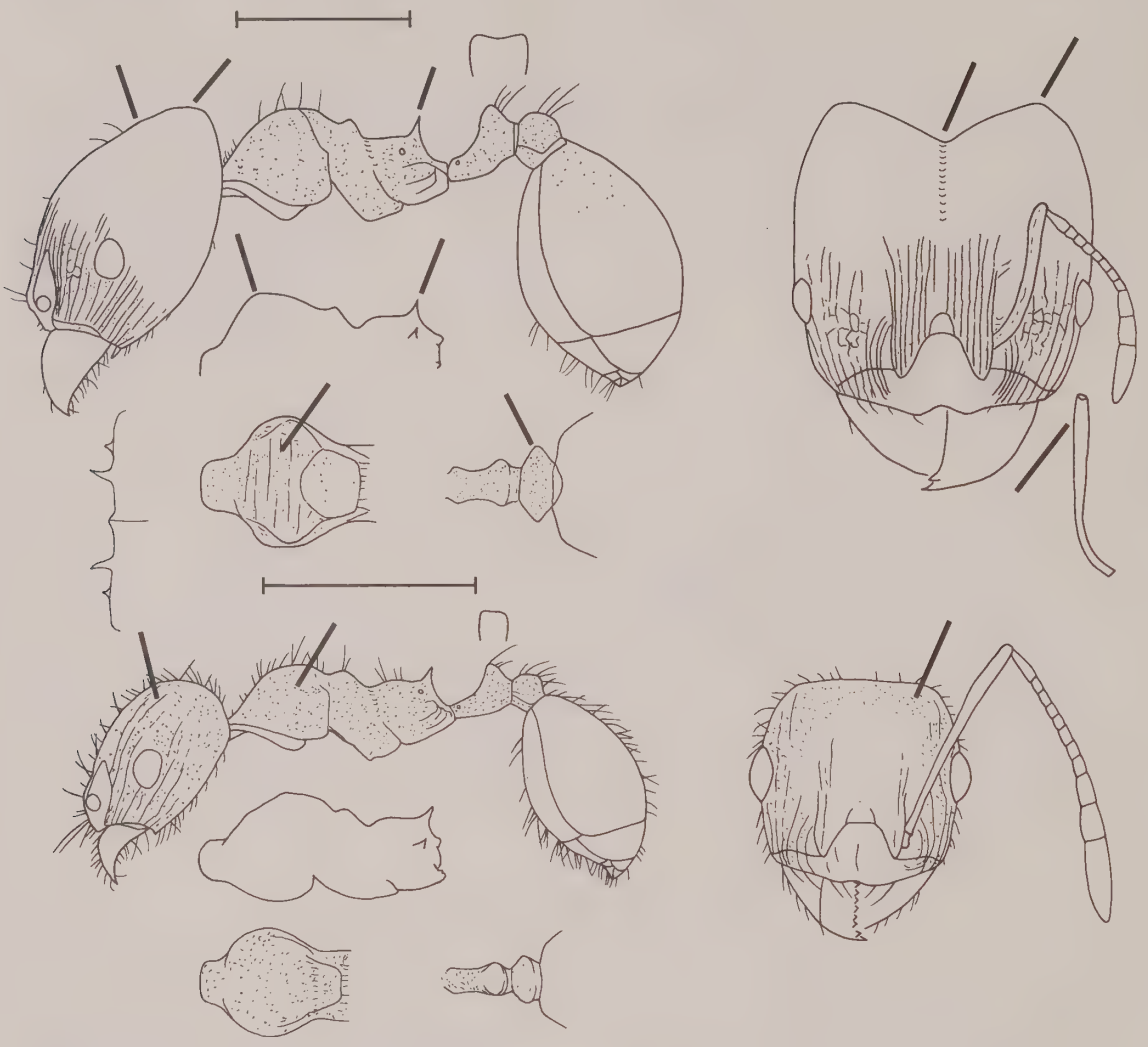


Pheidole socrates Forel, **new status**

Pheidole biconstricta socrates Forel 1912g: 223.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY L *socrates,* presumably after the philosopher.
DIAGNOSIS A large, light reddish yellow member of the *biconstricta* group, possessing spines in **major** and **minor**. In the **major**, also, longitudinal carinulae of frontal lobes extend in attenuated form posteriorly to near the occipital border. In the **minor**, the occiput is exceptionally broad in full-face view.
Otherwise, close to *biconstricta* and *plato*.
MEASUREMENTS (mm) Lectotype major: HW 1.84, HL 1.80, SL 1.10, EL 0.26, PW 0.88.
Paralectotype minor: HW 0.88, HL 0.94, SL 1.08, EL 0.10, PW 0.56.
COLOR Major and minor: concolorous light reddish yellow.
RANGE Amazonian Brazil to the Guianas (French Guiana, Guyanas, Suriname). Kempf (1972b) records *socrates* from Trinidad, but I have not seen the specimens.
BIOLOGY Unknown.

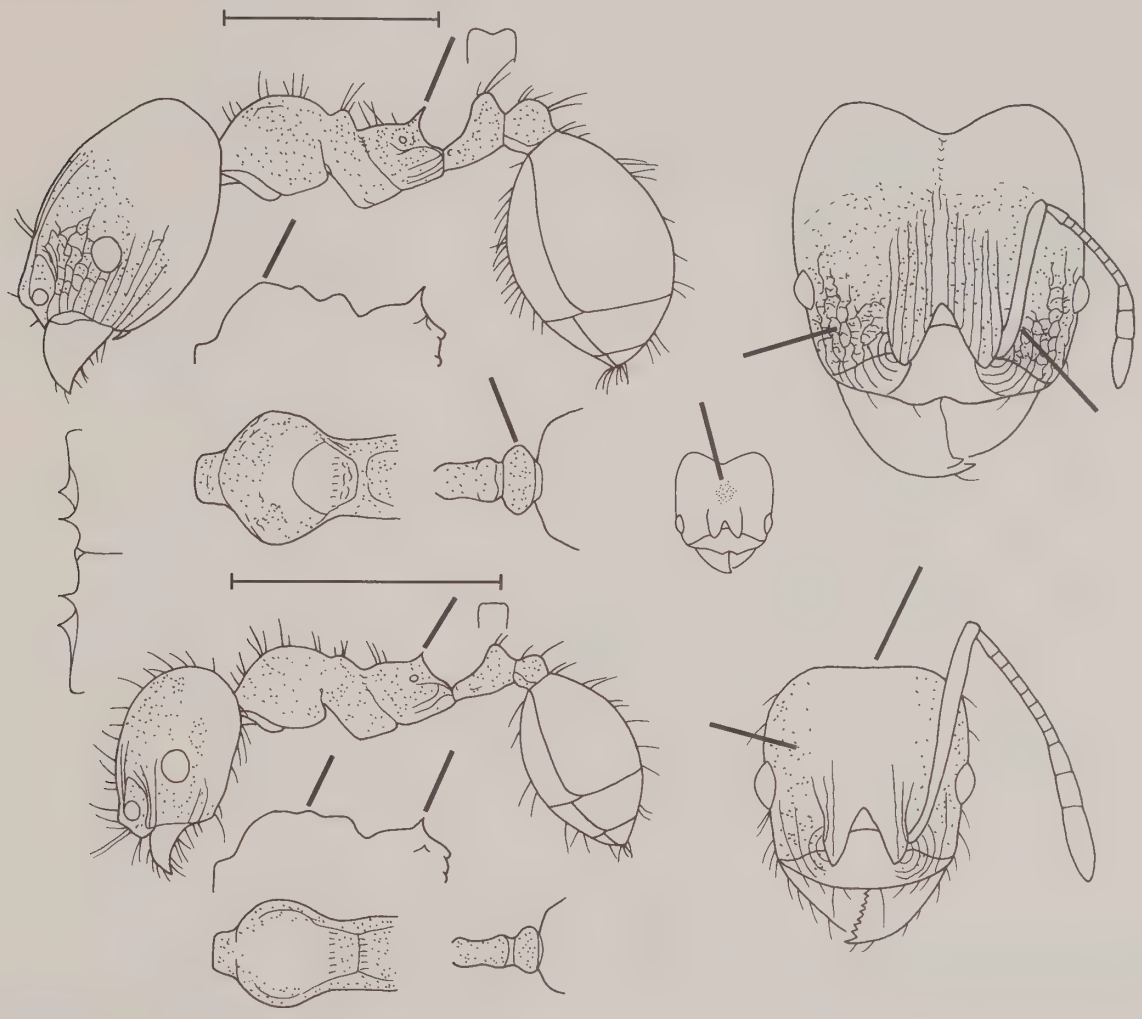
FIGURE Upper: holotype, major. Lower: paratype minor. TEXAS: Alice, Jim Wells Co., southern Texas (William F. Buren). Scale bars = 1 mm.



Pheidole bureni **new species**

TYPES Florida State Collection of Arthropods; Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the collector, the late American myrmecologist William F. Buren.
DIAGNOSIS A member of the *crassicornis* group distinguished by the following combination of traits.
Major: scape flattened at base; head in side view narrowed, its posterior dorsal surface flat; in full-face view, occipital border deeply concave and occipital lobes subangulate; propodeal spines long and vertical to propodeal dorsal face; pronotum transversely carinulate; mesosoma and waist completely foveolate and opaque; pilosity very sparse.
Minor: all of body foveolate and opaque except gaster, which is smooth and shiny; carinulae mesad to eyes extend to occiput.
MEASUREMENTS (mm) Holotype major: HW 1.50, HL 1.58, SL 0.80, EL 0.24, PW 0.76.
Paratype minor: HW 0.72, HL 0.80, SL 0.80, EL 0.20, PW 0.48.
COLOR Major: bicolorous, with all of body reddish yellow except gaster, which is medium to dark reddish brown.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: 19 km north of Estado Guanajuato, San Luis Potosí (William P. MacKay). Scale bars = 1 mm.



Pheidole coracina **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *coracina,* raven-like, alluding to color of the minor worker.

DIAGNOSIS A member of the *crassicornis* group characterized in the **major** by dense rugoreticula that stretch from each eye to the adjacent antennal fossa; bilobed dorsal-oblique profile of the pronotum; oval postpetiole from above; most of the prothorax and all of the mesothorax, propodeum, and waist foveolate and opaque; and a contrasting circular brown spot on the vertex.

Minor: blackish brown; pronotal profile bilobed in dorsal-oblique view; and all of body foveolate and opaque except venter of head, median half of the dorsal surface of the head, part of the promesonotum, and the gaster.

MEASUREMENTS (mm) Holotype major: HW 1.20, HL 1.24, SL 0.68, EL 0.18, PW 0.60.
Paratype minor: HW 0.60, HL 0.66, SL 0.70, EL 0.14, PW 0.40.

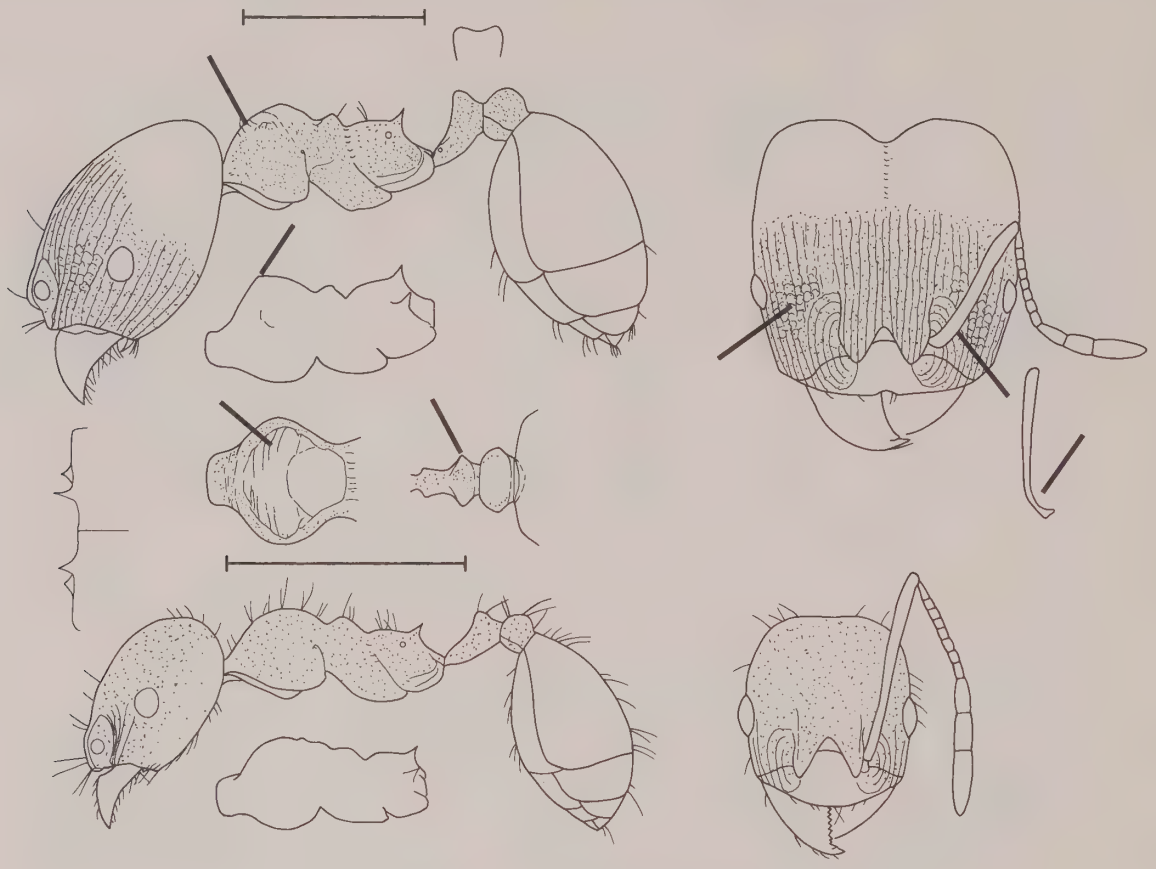
COLOR Major: body light reddish brown except for gaster, which is plain medium brown, and a dark brown circular spot on the vertex.
Minor: concolorous blackish brown.

RANGE Known only from the type series.

BIOLOGY Unknown.

Compare with species listed
in the Diagnosis below

FIGURE Upper: major. Lower: minor. NORTH CAROLINA: Belmont, Gaston Co., near Charlotte. (Labeled to species by Carlos Emery and likely part of his type series; the type locality is Charlotte.) Scale bars = 1 mm.

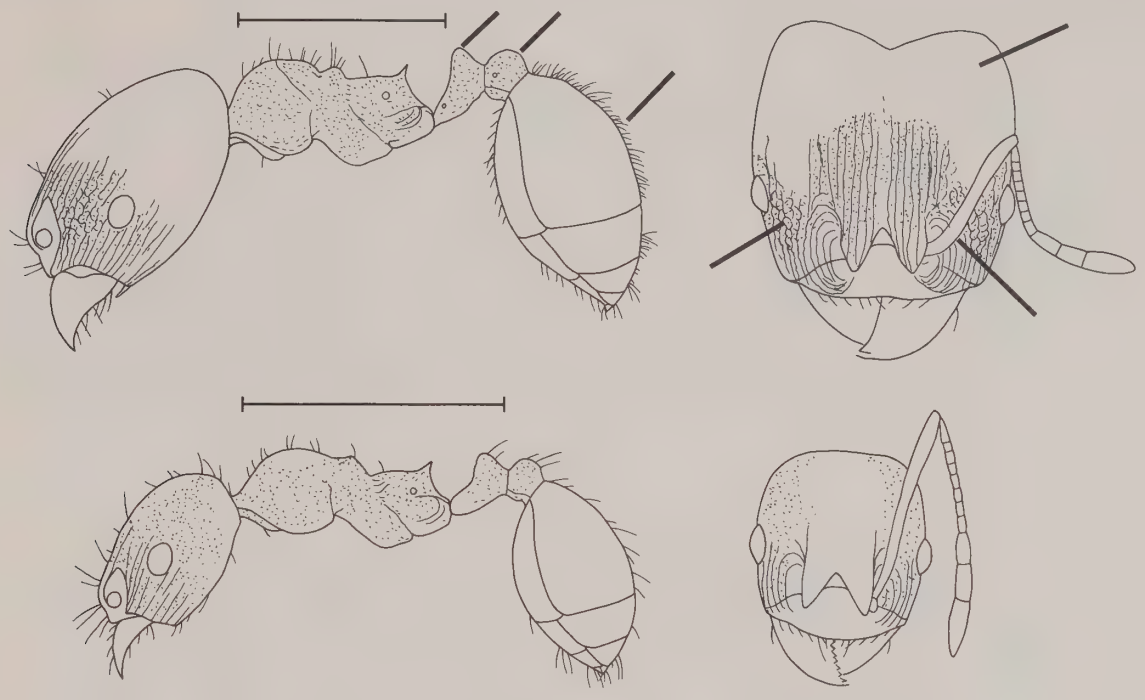


Pheidole crassicornis Emery

Pheidole crassicornis Emery 1895d: 296.

TYPES Mus. Civ. Stor. Nat. Genova; possibly also Mus. Comp. Zool. Harvard (see Figure caption above).
ETYMOLOGY L *crassicornis,* thick horn, referring to the expanded basal part of the antennal scape.
DIAGNOSIS A member of the *crassicornis* group distinguished by the following combination of traits.
Major: thickened basal portion of scape strongly curved toward the insertion, as illustrated; pilosity very sparse, usually almost absent from the head and gaster; humerus subangulate in dorsal-oblique view; pronotal dorsum marginally carinulate.
Minor: all of dorsal surface of head except middle of clypeus and frontal triangle, as well as all of mesosoma and waist, foveolate and opaque.
See also *diversipilosa, porcula, subporcula, tetra,* and *vallicola.*
MEASUREMENTS (mm) Major (Belmont, North Carolina): HW 1.30, HL 1.30, SL 0.78, EL 0.20, PW 0.64.
Minor (Belmont, North Carolina): HW 0.62, HL 0.74, SL 0.84, EL 0.10, PW 0.44.
COLOR Major: concolorous brownish yellow.
Minor: concolorous yellowish brown.
RANGE North Carolina to northern Florida and west to western Texas.
BIOLOGY In northern Florida, Naves (1985) found the species sympatric with *diversipilosa,* nesting in deep soil in forest clearings. The inconspicuous nest openings were never surrounded by craters of excavated soil of the kind common in other soil-dwelling species of *Pheidole,* and the vertical galleries ran at least 60 cm deep. Minors and occasionally majors foraged 4 meters or more from the nest entrances, and minors were observed retrieving live termites and small dead arthropods. In western Texas, Moody and Francke (1982) found colonies at 100–1700 m, nesting under stones and in open soil.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. TEXAS: Ft. Davis, southwestern Texas (W. M. Wheeler). Scale bars = 1 mm.



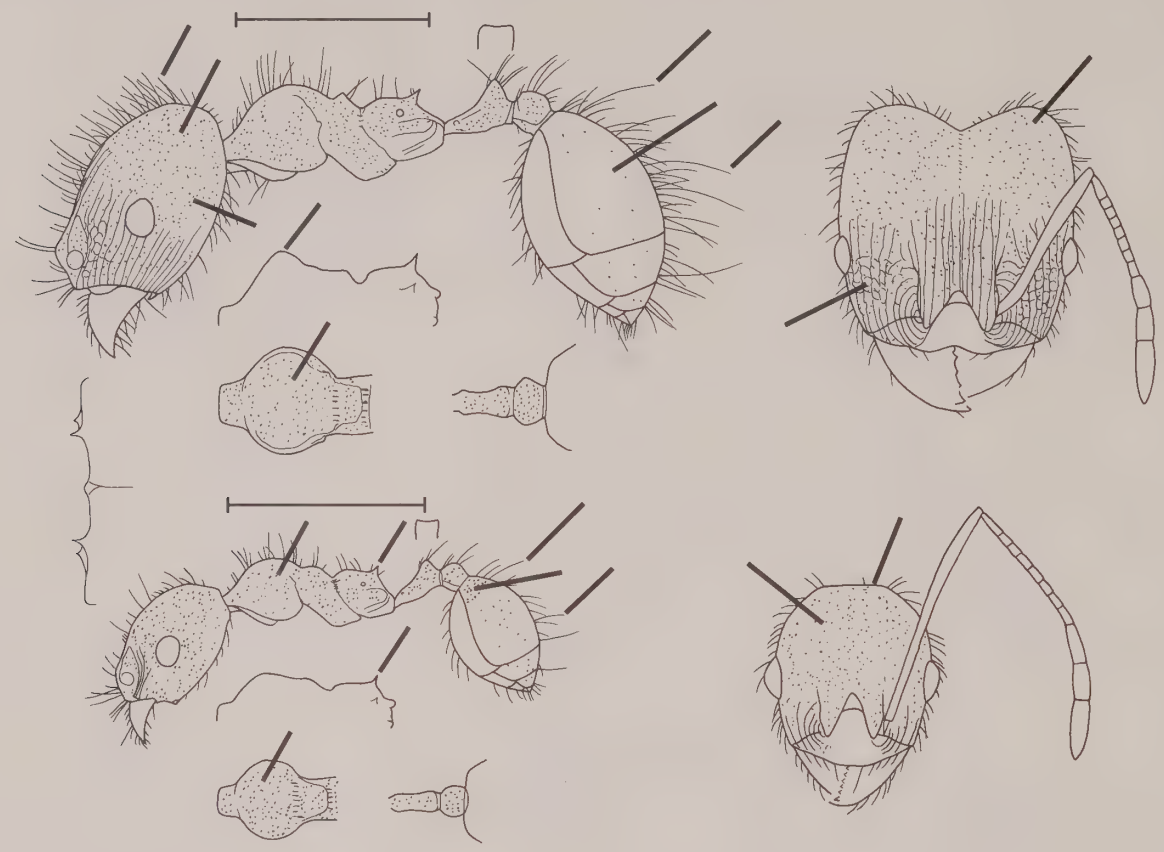
Pheidole diversipilosa Wheeler

Pheidole crassicornis var. *diversipilosa* Wheeler 1908h: 467. Raised to species level by Naves 1985: 61.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *diversipilosa,* different (variable) hair, alluding to the major.
DIAGNOSIS Very close to *crassicornis* from which it differs in the **major** by abundant pilosity on the mesosoma and gaster, and *tetra*, from which it differs in the **major** by the much shorter pilosity on the first gastral tergite and by sparseness or absence of pilosity on the waist and occiput.
Also resembles *pilosior* and *porcula* in various traits as depicted.
MEASUREMENTS (mm) Lectotype major: HW 1.26, HL 1.34, SL 0.66, EL 0.20, PW 0.66.
Paralectotype minor: HW 0.66, HL 0.74, SL 0.76, EL 0.16, PW 0.46.
COLOR Major and minor: body medium reddish brown, appendages light reddish brown.
RANGE Southwestern Texas to the mountains of southern and central Arizona.
BIOLOGY According to Stefan Cover (personal communication), *diversipilosa* is common at mid-elevations (1050–1900 m), favoring oak-pine-juniper forests, especially those in creek valleys, where it nests under rocks and in open soil. Colonies have single queens and large populations, which can exceed 1000 workers. Seed caches have been found in some nests.

Compare with *guerrerana, hyatti*

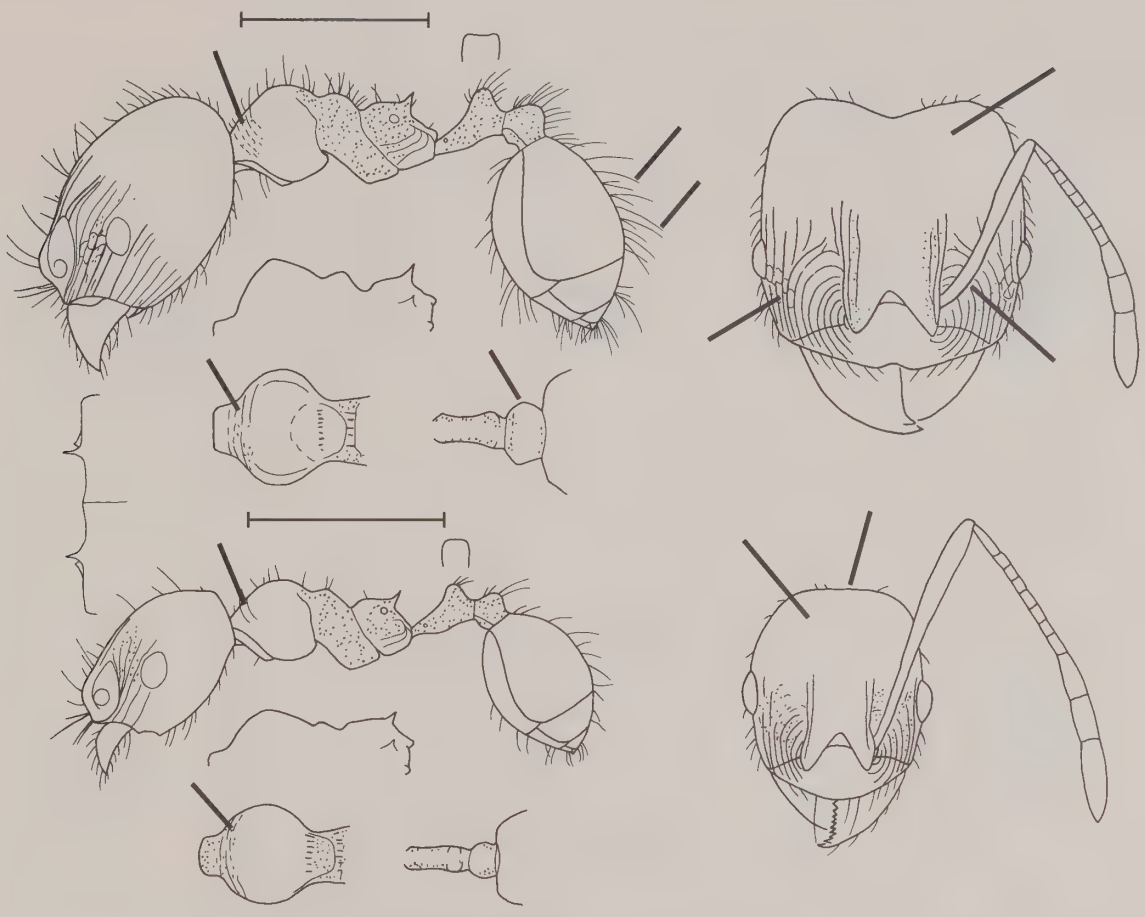
FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: San José Purua, Michoacán (A. B. Hamton). Scale bars = 1 mm.



Pheidole erethizon **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY NL *erethizon,* porcupine, referring to the very long, bristly pilosity of the major and minor.
DIAGNOSIS A member of the *crassicornis* group characterized in both the **major** and **minor** by exceptionally dense, long hair (reaching an extreme in the gastral pilosity of the **major**); and entire head (except frontal triangle and central piece of clypeus), mesosoma, and waist foveolate and opaque. In addition, the **minor** is unusual within the *crassicornis* group in possessing a narrowed occiput seen in full-face view, yet nevertheless lacking a nuchal collar.
MEASUREMENTS (mm) Holotype major: HW 1.26, HL 1.34, SL 0.92, EL 0.22, PW 0.64.
Paratype minor: HW 0.58, HL 0.70, SL 0.86, EL 0.16, PW 0.42.
COLOR Major: concolorous medium yellow with a very slight reddish tinge.
Minor: concolorous medium yellow.
RANGE Recorded from the type locality (Michoacán); Azizintla, Guerrero; and Miacatlan, Morelos.
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: 1.5 km east of Gomez Farías, Tamaulipas, 425 m (Robert J. Hamton). Scale bars = 1 mm.

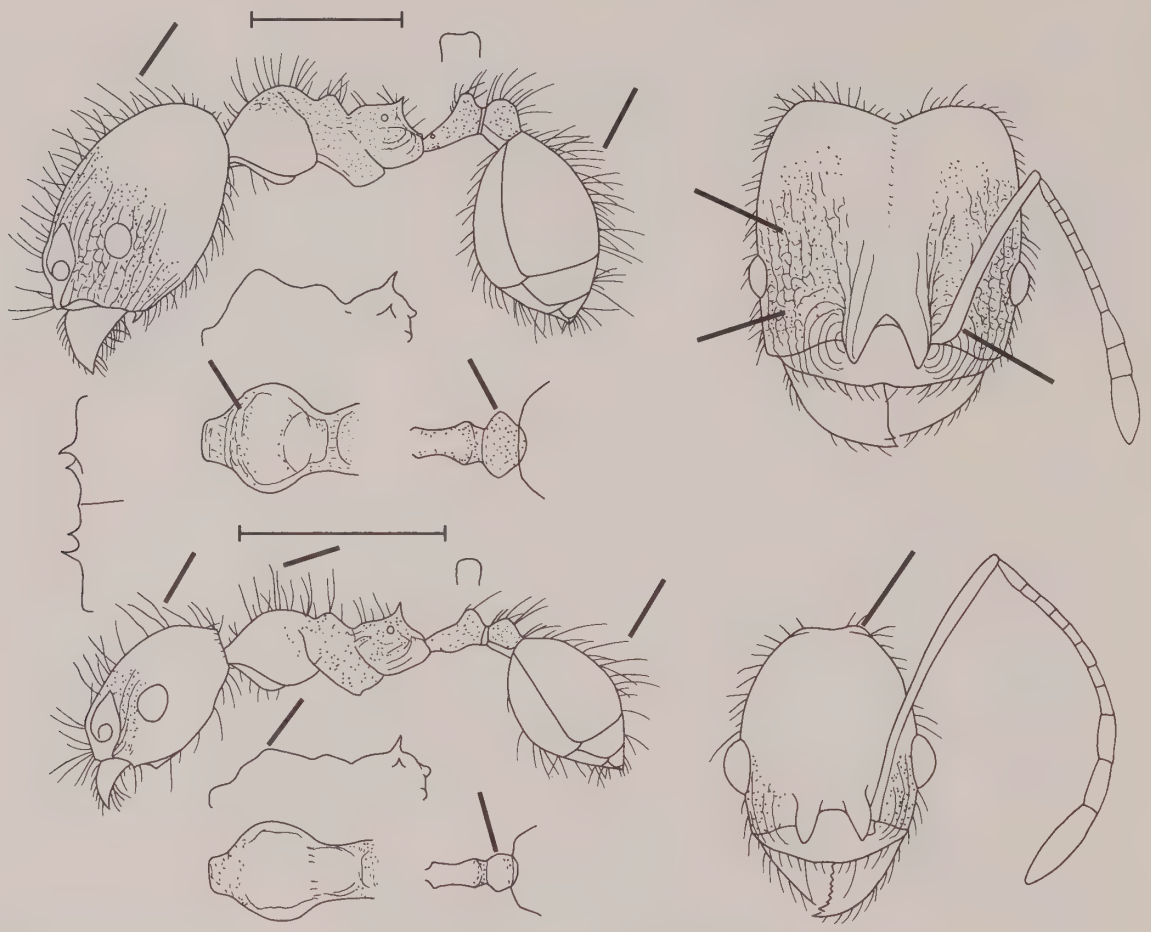


Pheidole fariasana **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the type locality.
DIAGNOSIS A member of the *crassicornis* group distinguished by the following combination of traits.
Major: medium to dark brown; rugoreticulum of head limited to small patches immediately mesad to each eye; posterior half of head capsule smooth and shiny; anterior strip of pronotal dorsum transversely carinulate, remainder of promesonotal dorsum smooth and shiny; postpetiole from above diamond-shaped; pilosity dense and long, especially on gaster.
Minor: dark brown with brownish yellow tarsi, posterior half of head capsule smooth and shiny; anterior strip of pronotal dorsum transversely carinulate, rest of pronotum smooth and shiny; occiput broad.
MEASUREMENTS (mm) Holotype major: HW 1.00, HL 1.04, SL 0.82, EL 0.18, PW 0.54.
Paratype minor: HW 0.60, HL 0.68, SL 0.80, EL 0.14, PW 0.40.
COLOR Major: head, lower half of pronotum, and appendages medium brown; remainder of body dark brown.
Minor: body dark, almost blackish brown; tarsi brownish yellow; rest of appendages light to medium brown.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *spathicornis*

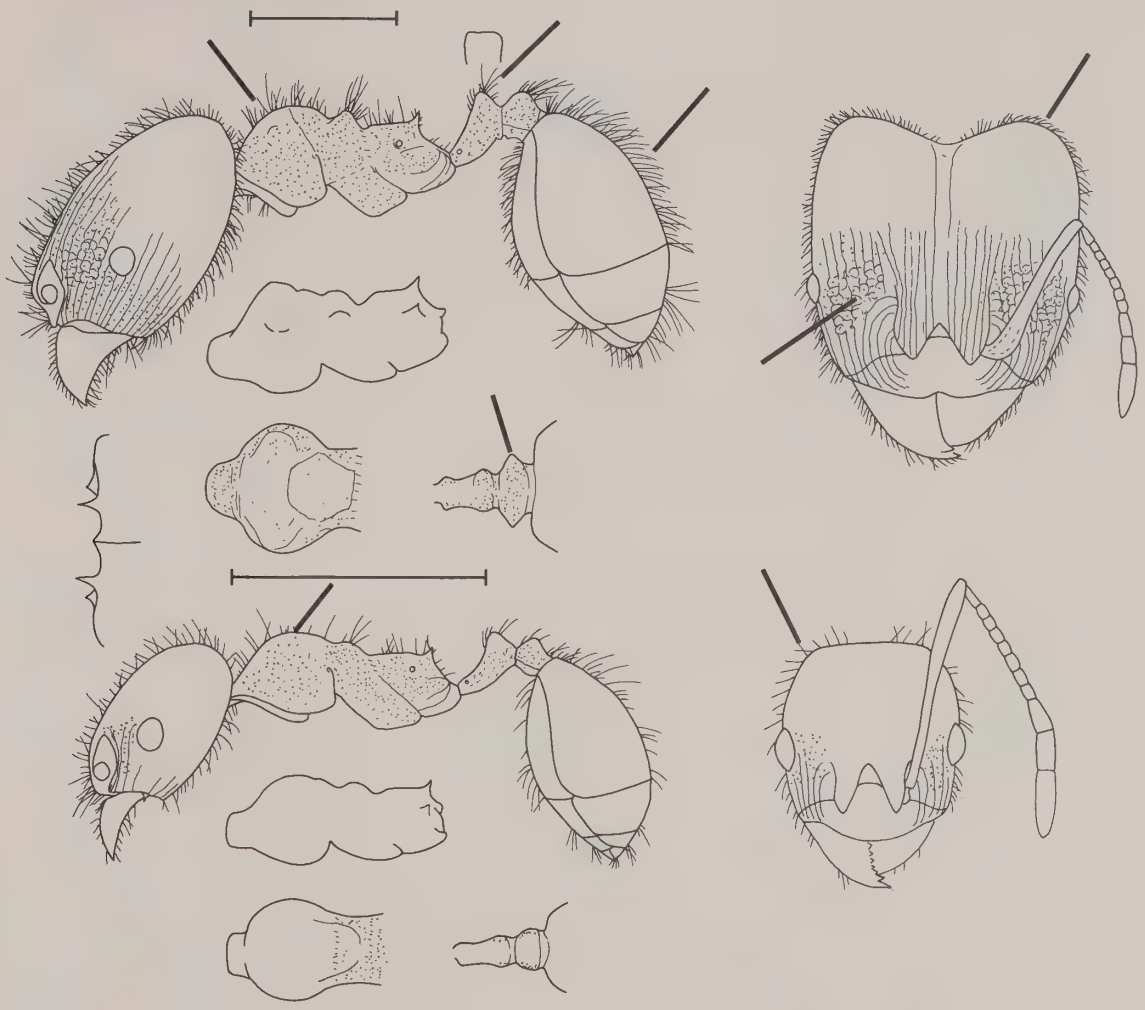
FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: at road 3.5 km below Omilteme, Guerrero, 2000 m (Cornell University Field Party). Scale bars = 1 mm.



Pheidole guerrerana **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the Mexican state of origin.
DIAGNOSIS A member of the *crassicornis* group distinguished by the following combination of traits.
Major: rugoreticulum mesad to the eyes very extensive, reaching from near the posterior clypeal border to midway between the eye and occiput; pilosity very dense and long, especially on the dorsal surfaces of the head and on the gastral tergites; anterior strip of pronotal dorsum transversely carinulate; postpetiole from above diamond-shaped.
Minor: pilosity extremely long over most of the body; humerus subangulate in dorsal-oblique view; occiput narrowed, with rudiment of a nuchal collar.
MEASUREMENTS (mm) Holotype major: HW 1.28, HL 1.42, SL 1.02, EL 0.24, PW 0.66.
Paratype minor: HW 0.58, HL 0.74, SL 0.94, EL 0.20, PW 0.42.
COLOR Major: head indistinctly bicolorous, with capsule anterior to eye level yellow and remainder yellowish brown; mesosoma and appendages yellowish brown; waist and gaster plain light brown.
Minor: indistinctly bicolorous, with head capsule posterior to anterior margin of eye as well as gaster and postpetiolar dorsum light brown; remainder of body dark yellow to brownish yellow.
RANGE Known only from the type locality.
BIOLOGY The nest of the type colony was beneath a rock in a forest clearing. A winged queen was present on 31 July.

FIGURE Upper: holotype, major. Lower: paratype, minor. TEXAS: Limpia Canyon creekbed, Davis Mts., Jeff Davis Co., southwestern Texas (Stefan Cover). Scale bars = 1 mm.



Pheidole pilosior **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *pilosior,* hairier.

DIAGNOSIS A member of the *crassicornis* group, similar to *crassicornis, diversipilosa, porcula, tetra,* and *vallicola,* and differing in the following combination of traits.

Major: reddish to dark brown; rugoreticulum of head forms a broad swath from eye to frontal carinae; pilosity very dense, forming a thick fringe of short hairs around the head and a thick mat of hairs of short to medium length on the first gastral tergite; petiolar node in side view tapered to a blunt point at the apex; postpetiolar node laterally acute-angulate; basal segment of scape 2× broader than distal segment.

Minor: dark brown; posterior dorsal half of head and promesonotal dorsum smooth and shiny.

MEASUREMENTS (mm) Holotype major: HW 1.54, HL 1.58, SL 0.86, EL 0.20, PW 0.76.

Paratype minor: HW 0.54, HL 0.68, SL 0.74, EL 0.14, PW 0.38.

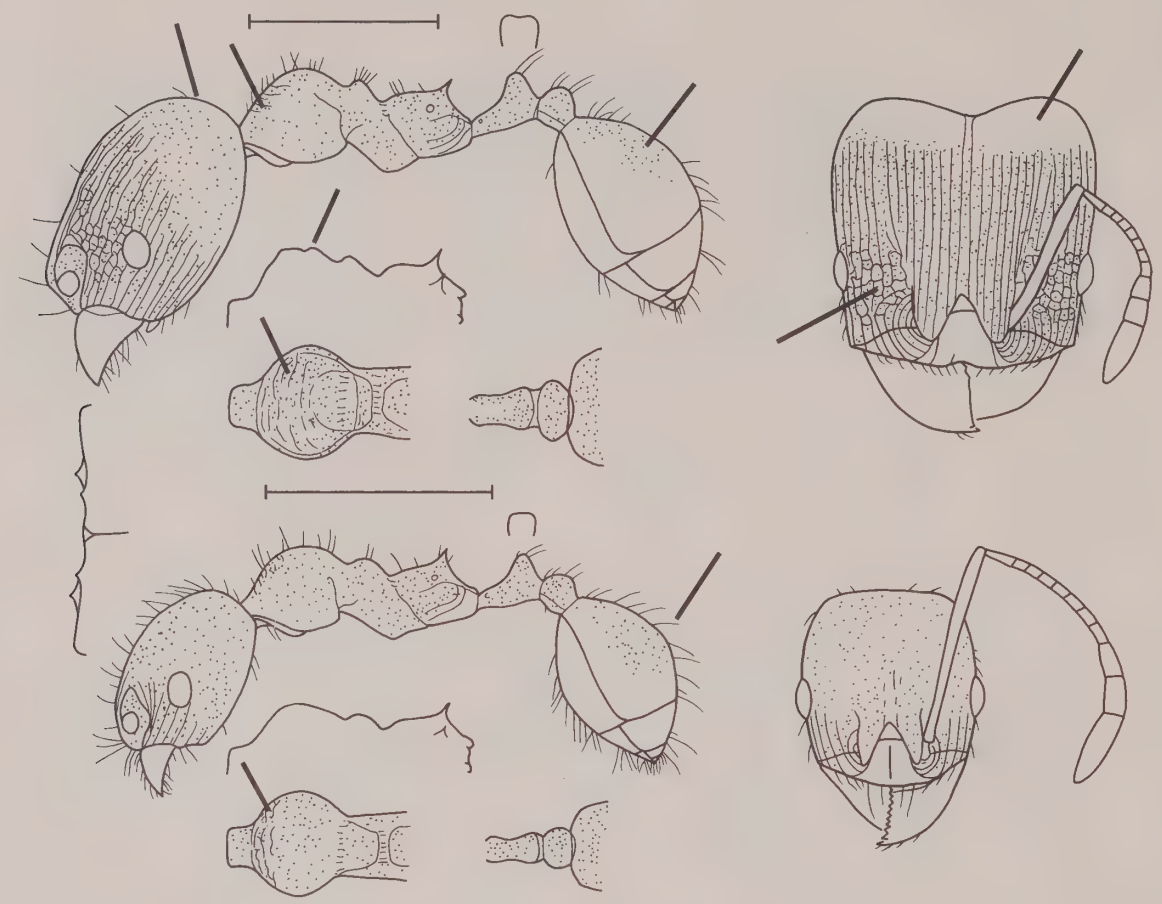
COLOR Major: head rich medium reddish brown, with broad area of vertex covering central half of head capsule dark brown; body dark brown; legs medium brown.

Minor: most of body and antennae dark, almost blackish brown; lateral wings of clypeus and legs medium brown.

RANGE Known only from the type locality.

BIOLOGY The type colony was collected by Cover in a heavily grazed creek floodplain forest, nesting beneath a stone in shade.

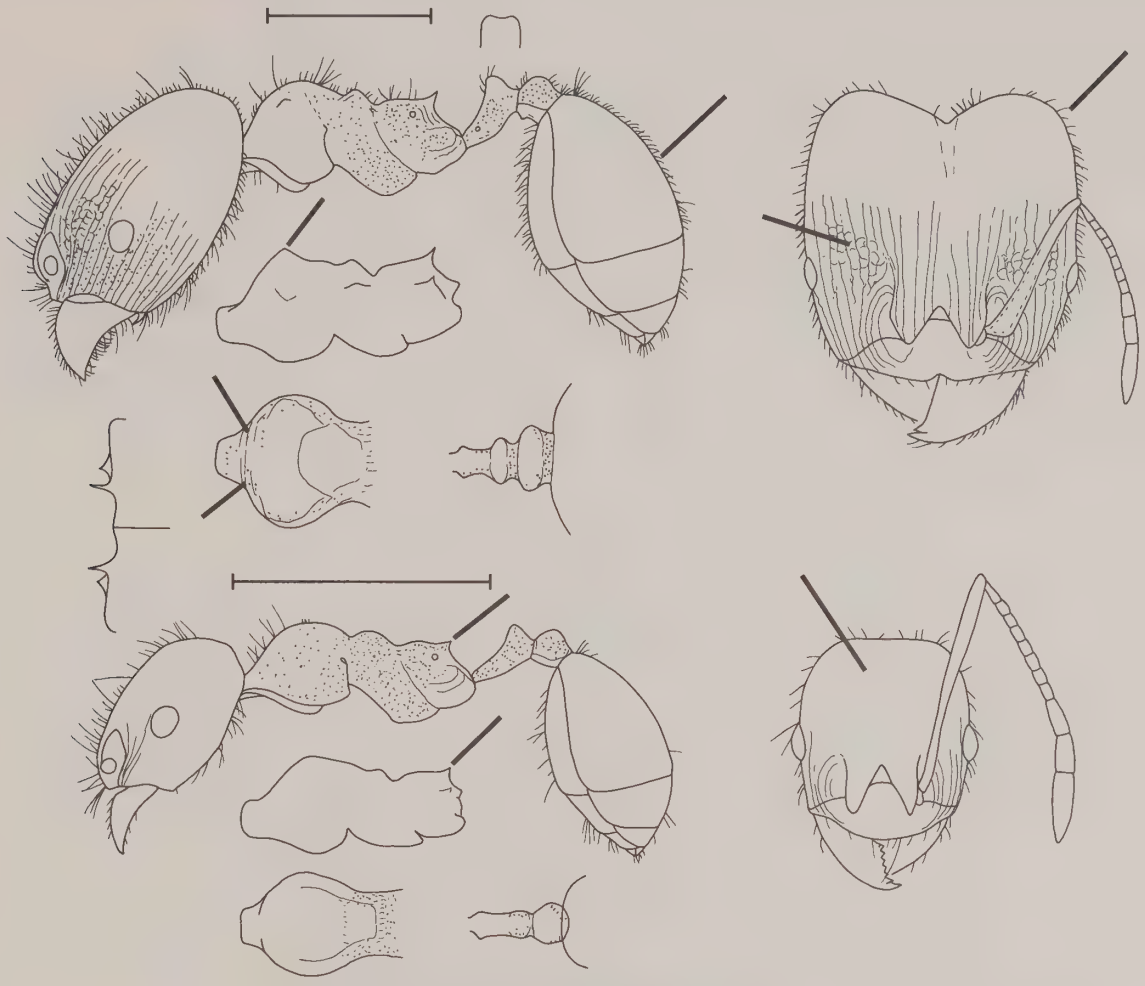
FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: pine forest, km 225 on Highway 85, Hidalgo (Cornell University Mexico Field Party 1965). Scale bars = 1 mm.



Pheidole pinicola **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *pinicola,* pine-dweller, based on habitat of type colony.
DIAGNOSIS A member of the *crassicornis* group distinguished by the following combination of traits.
Major: occiput, frontal triangle, and central piece of clypeus smooth and shiny, area between frontal carinae and eyes heavily rugoreticulate, and rest of dorsal surface of head longitudinally carinulate; all of mesosoma, waist, and anterior half of central strip of gastral tergite foveolate and opaque; pronotal dorsum transversely carinulate; pronotal profile in dorsal-oblique view bilobous.
Minor: all of head, mesosoma, and waist, and most of the first gastral tergite foveolate and opaque; anterior strip of pronotal dorsum transversely rugulose; mandibles and tarsi dark yellow.
MEASUREMENTS (mm) Holotype major: HW 1.30, HL 1.30, SL 0.80, EL 0.20, PW 0.66.
Paratype minor: HW 0.66, HL 0.76, SL 0.80, EL 0.16, PW 0.46.
COLOR Major: head and appendages light reddish brown; rest of body medium reddish brown.
Minor: body medium reddish brown, mandibles and tarsi dark yellow.
RANGE Known only from the type locality.
BIOLOGY The type series were collected in pine forest.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. TEXAS: Chisos Mts., Big Bend of southwestern Texas (O. W. Williams). Scale bars = 1 mm.



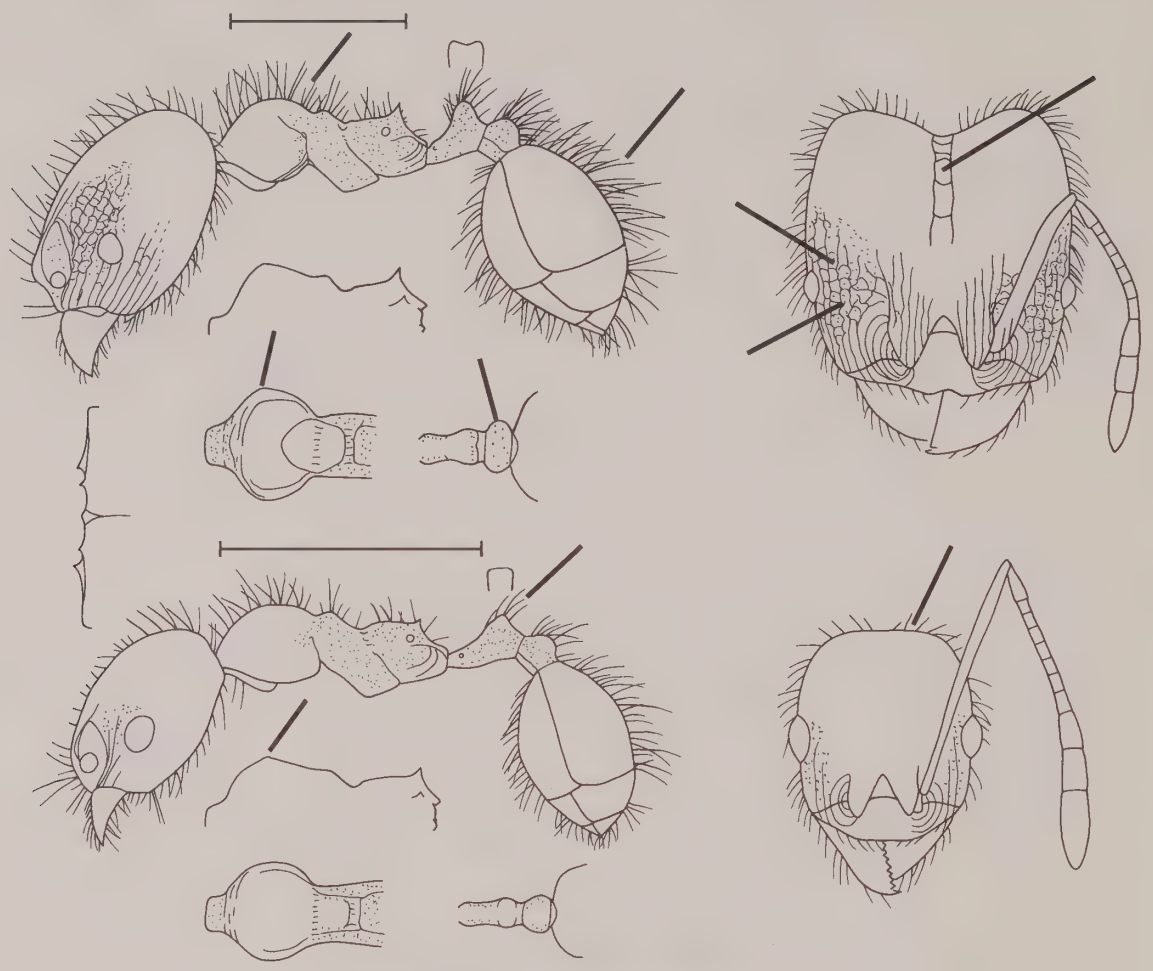
Pheidole porcula Wheeler

Pheidole crassicornis subsp. *porcula* Wheeler 1908h: 466. Raised to species level by Creighton 1950a: 187.

TYPES Mus. Comp. Zool. Harvard; Amer. Mus. Nat. Hist.
ETYMOLOGY L *porcula,* little pig-like.
DIAGNOSIS A member of the *crassicornis* group close to *crassicornis, diversipilosa, tetra,* and *vallicola,* differing from these species in the following combination of traits.
Major: yellow; rugoreticulum on head stretches from frontal carinae obliquely upward posterior to level of eye but does not reach the eye; pilosity dense, in full-face view fringing the head and on the first gastral tergite forming a very short, uniform felt; humerus subangulate; postpetiole from above oval, not angulate; scape at widest part of basal portion is 2× widest part of distal portion; pronotum smooth and shiny except for anterior fringe, which is carinulate.
Minor: posterior half of head completely smooth and shiny, pronotum sparsely foveolate, feebly shiny; propodeal spines reduced to denticles.
MEASUREMENTS (mm) Lectotype major: HW 1.58, HL 1.60, SL 0.92, EL 0.20, PW 0.78.
Paralectotype minor: HW 0.60, HL 0.74, SL 0.84, EL 0.12, PW 0.40.
COLOR Major: concolorous yellow.
Minor: concolorous light reddish brown.
RANGE Chisos Mts. of the Big Bend of southwestern Texas to the vicinity of Abilene and San Angelo, central Texas; probably also occurs in upland Chihuahua.
BIOLOGY Near San Angelo, Texas, Stefan Cover (unpublished notes) found a nest in a grassy flat, in clayey soil beneath a rock. Moody and Francke (1982) found numerous colonies in western Texas at 100–1700 m, nesting variously under stones, logs, cow dung, and under wood and fragments of metal, as well as in open soil.

Compare with *guerrerana*

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: Villa Santiago, Cola de Caballo, Morelos (Francisco Perez D.). Scale bars = 1 mm.



Pheidole spathicornis **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *spathicornis,* broad-bladed horn, referring to the scape.

DIAGNOSIS A member of the *crassicornis* group, most resembling *guerrerana,* and differing from that and other species of the group by the following combination of traits.

Major: rugoreticulum on head extends mesad to eye anteriorly half way to the anterior genal border and posteriorly nearly halfway to the occipital borders; a loosed, ladder-like rugoreticulum also extends along the midline of the dorsal surface of the head capsule from the occiput halfway to the frontal triangle; pilosity very long and dense; postpetiole from above oval, not laterally angulate.

Minor: humerus in dorsal-oblique view subangulate; propodeal spines reduced to denticles; petiolar node from side tapers to a point; occiput broad, and nuchal collar absent.

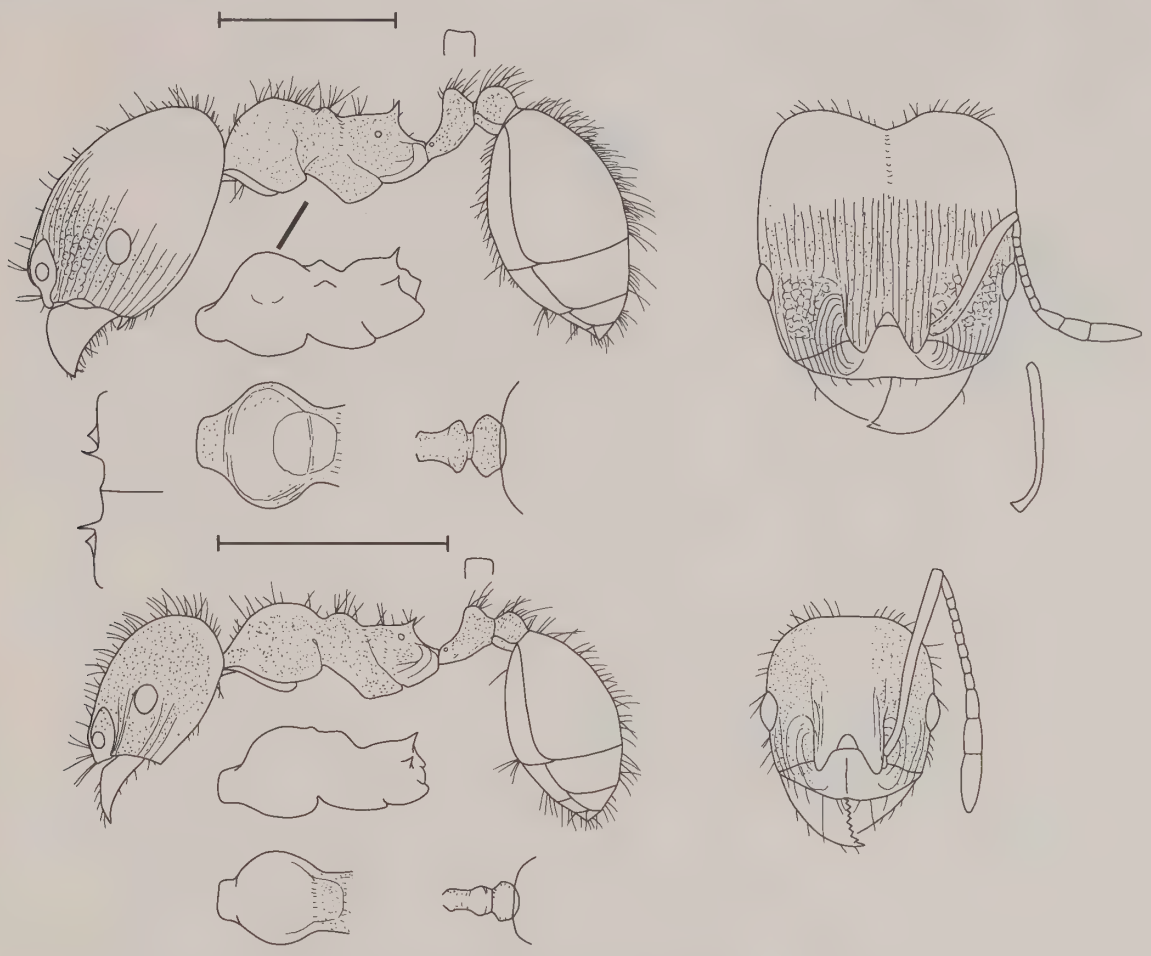
MEASUREMENTS (mm) Holotype major: HW 1.26, HL 1.38, SL 0.82, EL 0.18, PW 0.64.
Paratype minor: HW 0.60, HL 0.75, SL 0.80, EL 0.14, PW 0.40.

COLOR Major: concolorous reddish yellow.
Minor: head and gaster plain light brown; mesosoma, waist, and appendages yellowish brown.

RANGE Known only from the type locality.

BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. TEXAS: Austin (W. M. Wheeler). Scale bars = 1 mm.



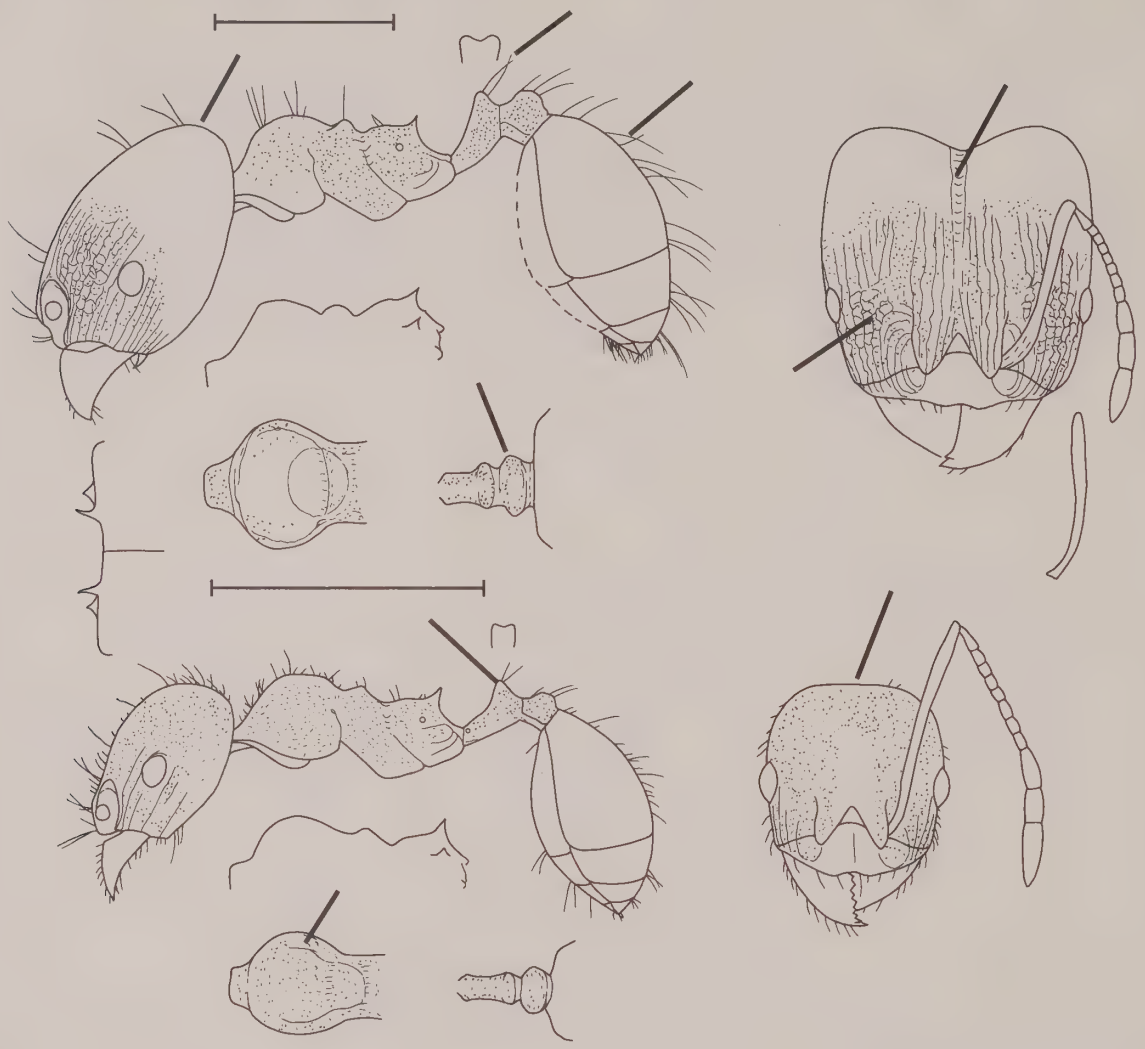
Pheidole tetra Creighton, **new status**

Pheidole crassicornis subsp. *tetra* Creighton 1950a: 176, first available use of *Pheidole crassicornis* subsp. *porcula* var. *tetra* Wheeler 1908h: 467, unavailable name (quadrinomial).

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *tetra,* four, significance unknown.
DIAGNOSIS Very close to *crassicornis,* from which it differs in the **major** by its generally abundant pilosity, and *diversipilosa,* from which it differs in the longer pilosity on the first gastral tergite and abundant hairs on the waist and occiput.
Also resembles *porcula* in various traits as depicted.
MEASUREMENTS (mm) Lectotype major: HW 1.34, HL 1.36, SL 0.72, EL 0.20, PW 0.66.
Paralectotype minor: HW 0.66, HL 0.74, SL 0.74, EL 0.14, PW 0.44.
COLOR Major and minor: concolorous light to dark reddish brown.
RANGE Known from St. Louis Co., Missouri; Ouachita Mts., Montgomery Co., Arkansas; central and western Texas; and the mountains of southern Arizona at 1280–1580 m.
BIOLOGY In the Ouachita Mts. of Arkansas, Stefan Cover (unpublished field notes) found colonies at three localities in open areas of mixed pine-hardwood forest, nesting beneath rocks. At the Pedernales Falls State Park, Blanco Co., Texas, he found two colonies under rocks in grassy clearings, nesting in sandy soil; and in Cochise Co., Arizona, Cover discovered a colony in cottonwood floodplain forest, apparently nesting in open soil. In western Texas, Moody and Francke (1982) found *tetra* at 400–1600 m, nesting variously under stones and logs and in open soil.

Compare with species listed
in the Diagnosis below

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ARIZONA: Miller Canyon, Huachuca Mts., southeastern Arizona (W. M. Wheeler). Scale bars = 1 mm.

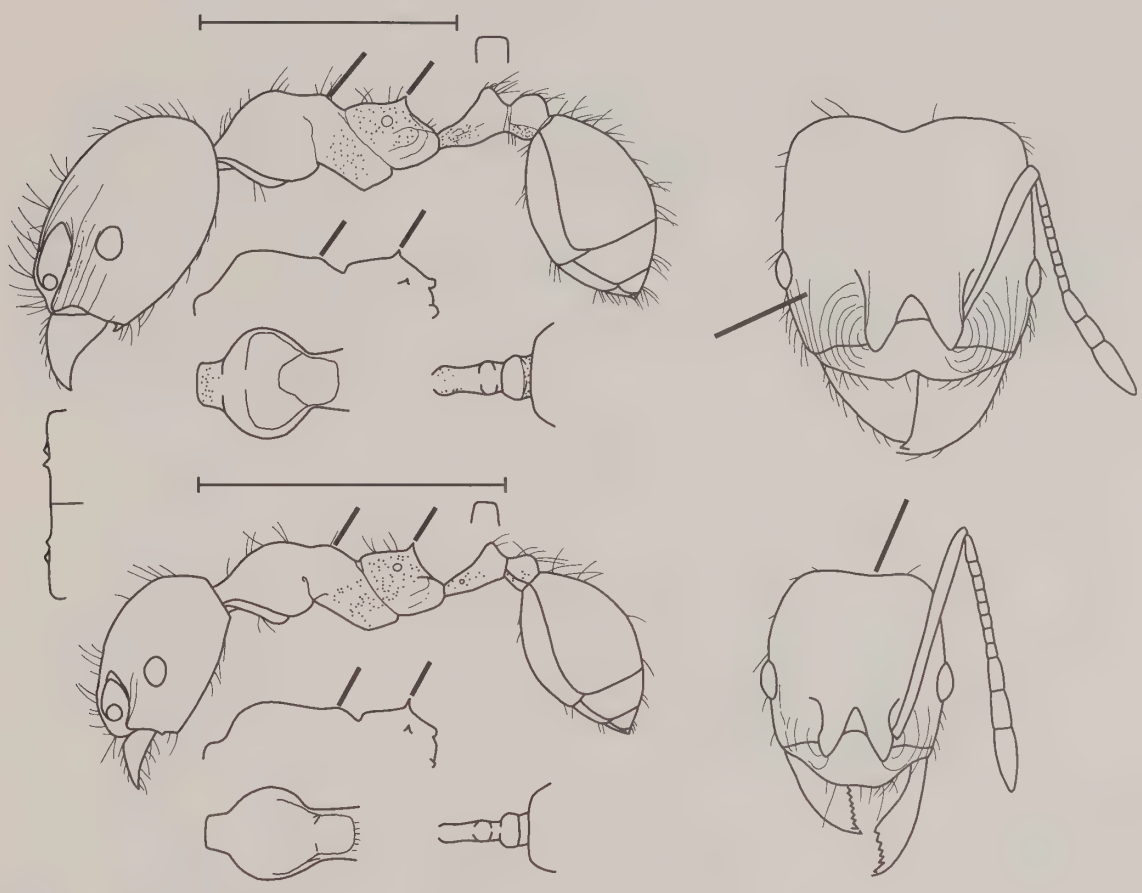


Pheidole vallicola Wheeler

Pheidole crassicornis subsp. *vallicola* Wheeler 1915b: 409. Raised to species level by Creighton 1950a: 191.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *vallicola,* valley dweller, referring to the habitat of the type colony.
DIAGNOSIS A member of the *crassicornis* group, similar to *crassicornis, diversipilosa, porcula,* and *tetra,* but differing by the following combination of traits.
Major: pilosity consisting of sparse, very long hairs (some on first gastral tergite are 2× the maximum eye length); head in side view tapered toward occiput; rugoreticulum forms a broad swath from antennal fossa to eye on each side; carinulae along midline of dorsum of head continue to occiput; pronotum sparsely foveolate and feebly shining on sides, smooth and shiny on dorsum; postpetiole from above laterally subangulate.
Minor: petiolar node from side thin, and tapered toward apex; pilosity sparse, as illustrated; dorsum of head (except for frontal triangle and middle section of clypeus), all of mesosoma, and most of waist foveolate and opaque.
MEASUREMENTS (mm) Lectotype major: HW 1.34, HL 1.44, SL 0.80, EL 0.20, PW 0.64.
Paralectotype minor: HW 0.64, HL 0.70, SL 0.82, EL 0.14, PW 0.44.
COLOR Major: body light reddish brown except for gaster, which is a slightly contrasting medium reddish brown.
Minor: concolorous medium reddish brown.
RANGE Recorded by Stefan Cover in numerous collections at 1200–1900 m in the following mountain ranges of southeastern Arizona: Chiricahua, Dragoon, Huachuca, Pajarito, Pinal, and Sierra Ancha.
BIOLOGY Stefan Cover (unpublished collection notes) found *vallicola* to favor creek banks and open woodland with a wide range of species composition, from ponderosa pine to oak, pine-oak-juniper, and oak-mesquite-sumac. Nests were usually under stones in either shade or exposed areas, although occasionally they had been constructed in open soil.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. PERU: Matucana, 2200 m (Charles T. Brues). Scale bars = 1 mm.

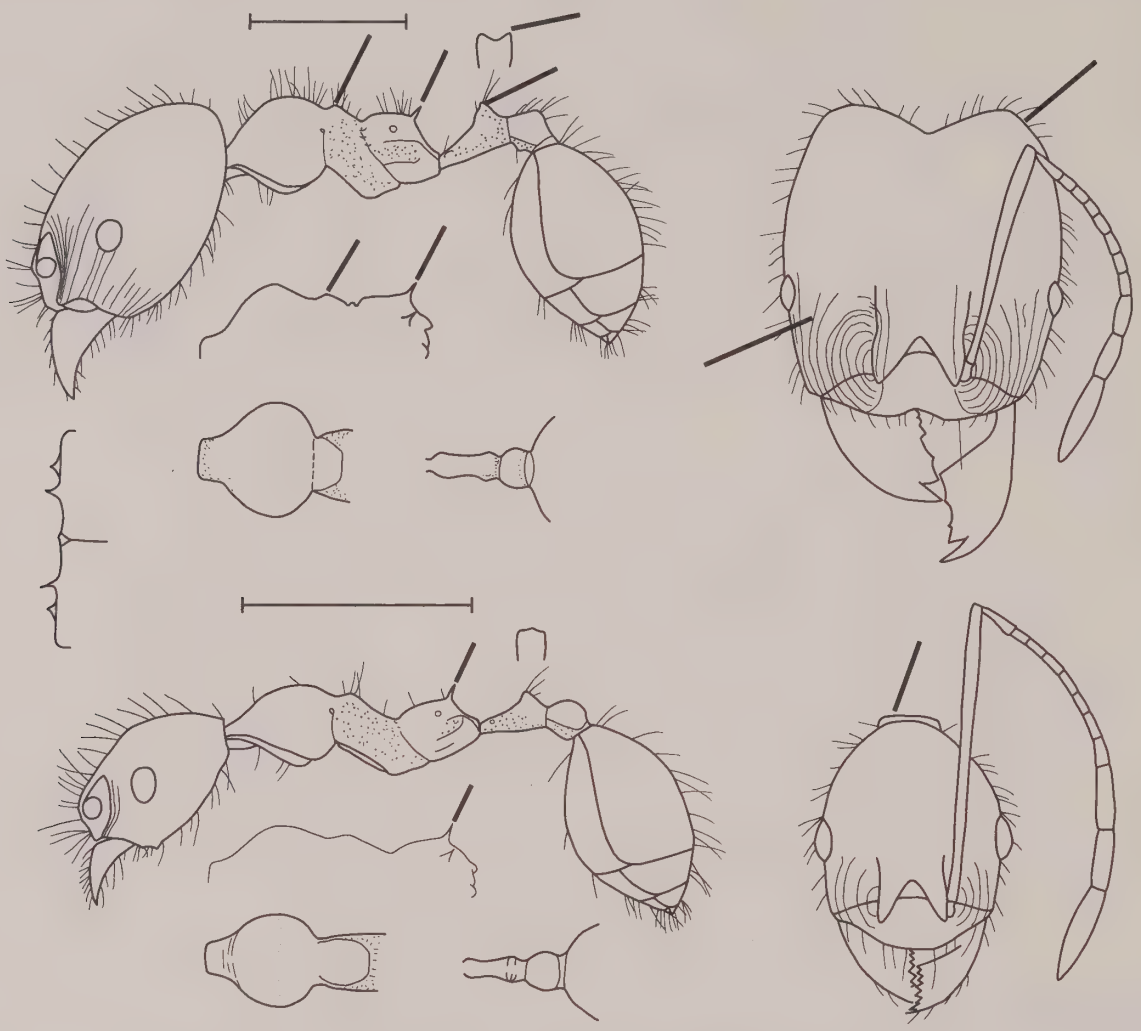


Pheidole accinota Wheeler

Pheidole accinota Wheeler 1925a: 16.

TYPES Mus. Comp. Zool. Harvard; Roy. Mus. Stockholm.
ETYMOLOGY Unknown.
DIAGNOSIS A small, yellowish brown member of the *diligens* group, with both **major** and **minor** further distinguished by a low mesonotal convexity, shallow metanotal depression in side view, and hence a more nearly cylindrical form of the mesosoma in side view than is usual for *Pheidole*; small propodeal spines; sculpturing reduced to carinulae at eye level and anterior to it on the dorsal surface of the head; foveolation on the mesopleuron and propodeum; and with the remainder of the head and body smooth and shiny. The **minor** is also notable for its broad, concave occiput, lacking a nuchal collar. See also *alpestris* and *quiaccana*.
MEASUREMENTS (mm) Lectotype major: HW 0.90, HL 0.90, SL 0.64, EL 0.14, PW 0.46.
Paralectotype minor: HW 0.52, HL 0.62, SL 0.62, EL 0.10, PW 0.36.
COLOR Major and minor: head, mesosoma, and waist yellowish brown; gaster and appendages yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios (Stefan Cover and John E. Tobin). Scale bars = 1 mm.



Pheidole aciculata **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *aciculata,* with a small needle, referring to the needle-like propodeal spines.

DIAGNOSIS A unique member of the *diligens* group.

Major: propodeal spines exceptionally thin, sharp, needle-like; head seen from the side forming a relatively thin ellipsoid and in full face view a symmetrical oval; petiolar node from sides acute at apex, and from behind with deeply concave dorsal border and angular corners; carinulae limited to eye level and forward on head, and every other part of the head and body almost entirely smooth and shiny.

Minor: propodeal spine very thin, acute, and needle-like; most of the head and body smooth and shiny; occiput narrowed and with a nuchal collar.

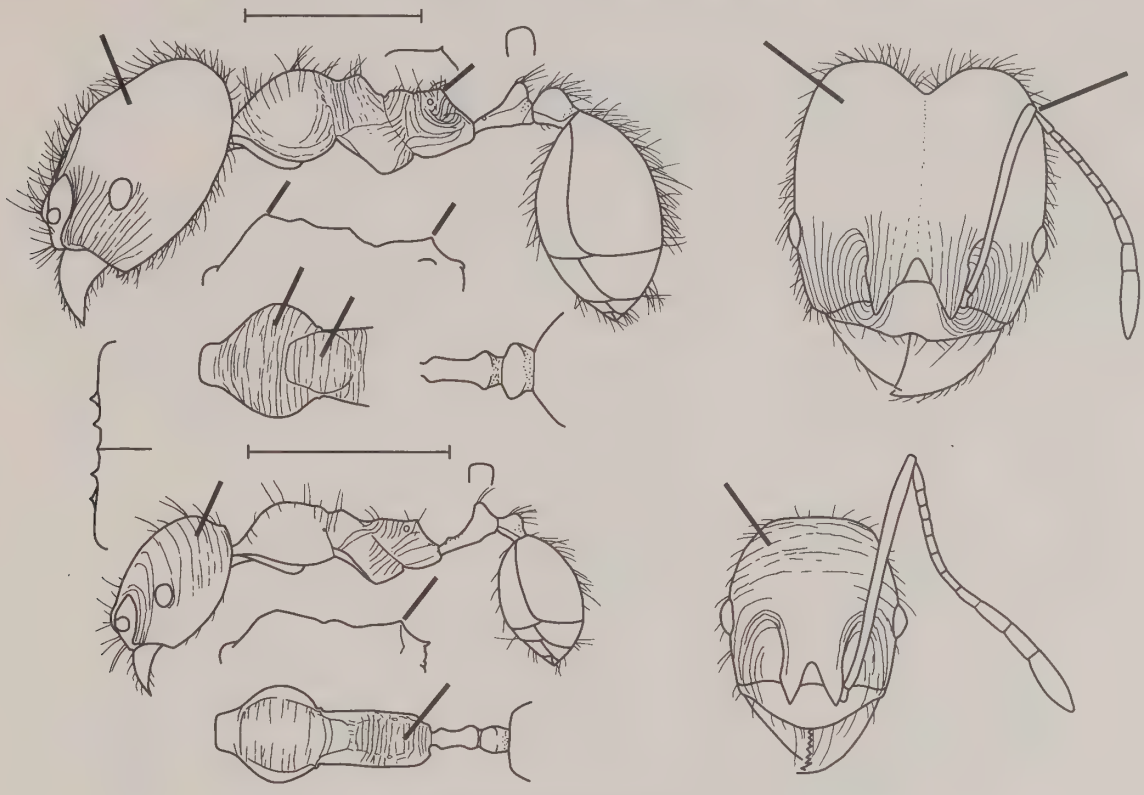
MEASUREMENTS (mm) Holotype major: HW 1.36, HL 1.58, SL 1.06, EL 0.20, PW 0.72.
Paratype minor: HW 0.60, HL 0.80, SL 1.06, EL 0.16, PW 0.42.

COLOR Major: overall light reddish brown, darkening (tending to medium reddish brown) on rear half of head, dorsal surface of promesonotum, and gaster.
Minor: body medium brown, tending to yellowish brown on mesopleuron and sides of petiole and postpetiole; appendages light brownish yellow.

RANGE Known only from the type locality.

BIOLOGY The single colony reported by Stefan Cover (collection notes) was in terra firme forest, nesting in clayey soil with a small crater.

FIGURE Upper: major. Lower: minor. COSTA RICA: Vara Blanca (lectotype and paralectotype of junior synonym *P. innupta* Menozzi). The type locality of *alfaroi* Emery, the senior synonym, is La Palma, near Bajo la Hondura, Costa Rica, 1500 m. The second, upper outline of the major propodeum is of the *alfaroi* lectotype major. Scale bars = 1 mm.



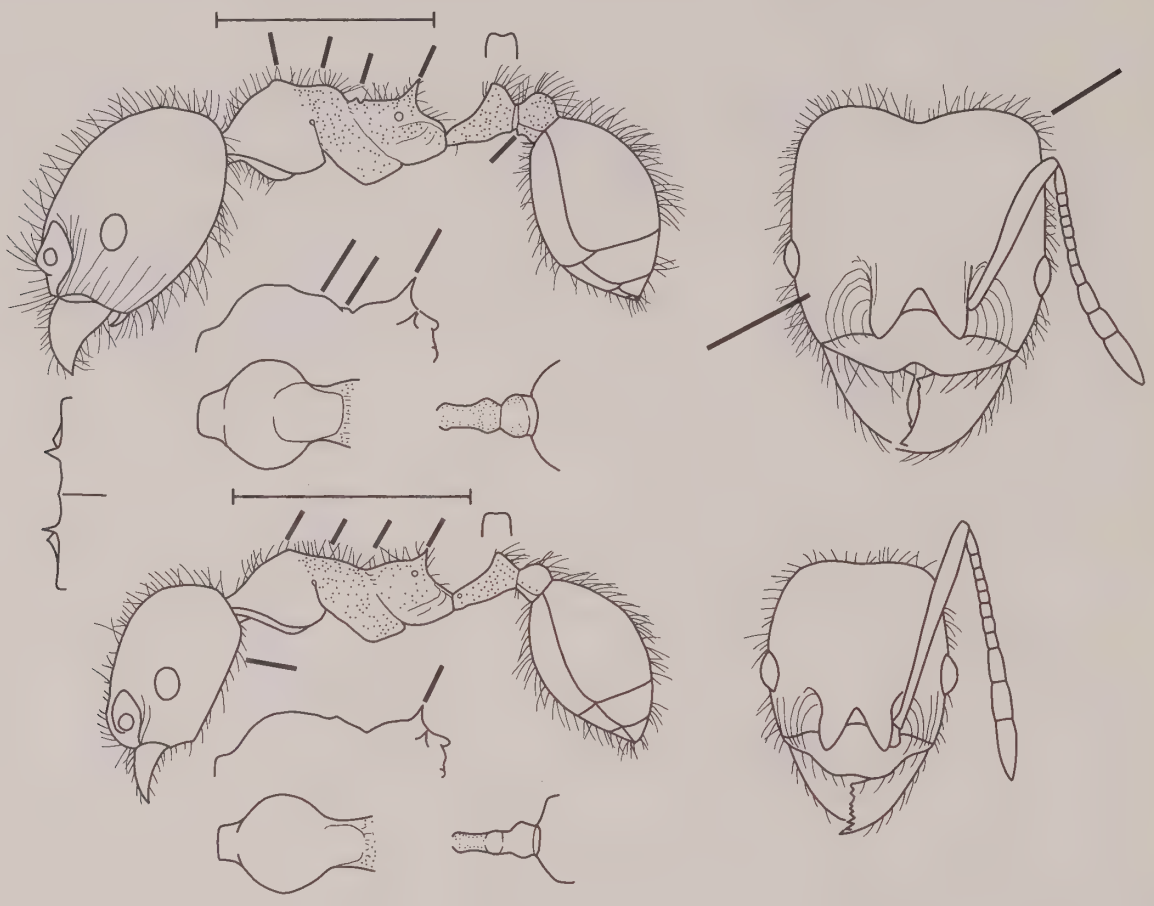
Pheidole alfaroi Emery

Pheidole alfaroi Emery 1896g: 70. Syn.: *Pheidole innupta* Menozzi 1931d: 200, n. syn. (provisional, see Diagnosis and Color below).

TYPES Mus. Civ. Stor. Nat. Genova. (Types of *innupta* Menozzi are in the Instituto di Entomologia "Guido Grandi.")
ETYMOLOGY Eponymous.
DIAGNOSIS A member of the *diligens* group closest to the Costa Rican *P. diana* but distinguished from it and other members of the group by the following combination of traits.
Major: in side view propodeal spine reduced to a denticle (but in *innupta* syntype reduced to an obtuse angle; see illustration); in dorsal-oblique view, promesonotum weakly bilobate and humerus subangulate; promesonotal dorsum and all of propodeum "striped" with parallel carinulae.
Minor: circular carinulae around antennal fossae reach all the way to the eye and are succeeded by other circular, "wraparound" carinulae that continue to the sides of the head; most of promesonotal dorsum and all of propodeum carinulate.
The types of *alfaroi* and *innupta* are virtually identical except for color (see below) and possibly a small difference in the propodeal angle (see illustration), and I have interpreted them as no more than color forms of the same species in the upland area around La Palma and Vara Blanca. Longino (1997) considers them sibling species, noting that *innupta* is "always black and nests under epiphytes," whereas the types of *alfaroi* are light colored and were found in rotting wood. If subsequent field research upholds these differences, Longino's interpretation is probably correct, and the nomenclature can be easily adjusted. Series from upland Panama and Colombia placed by me in *alfaroi* are intermediate in color: light to medium reddish brown.
MEASUREMENTS (mm) Lectotype major of *alfaroi*: HW 1.42, HL 1.52, SL 1.04, EL 0.20, PW 0.74.
Lectotype major of *innupta*: HW 1.44, HL 1.46, SL 1.06, EL 0.22, PW 0.72.
Paralectotype minor of *alfaroi*: HW 0.62, HL 0.74, SL 0.86, EL 0.12, PW 0.44.
Paralectotype minor of *innupta*: HW 0.62, HL 0.78, SL 0.92, EL 0.12, PW 0.44.
COLOR Major of *alfaroi*: concolorous light reddish yellow.
Major of *innupta*: body medium brown, appendages light brown.
Minor of *alfaroi*: concolorous clear yellow.
Minor of *innupta*: medium brown, appendages light brown.
RANGE Uplands of Costa Rica (1000–1600 m), Panama (El Volcán Chiriquí, 1150 m), and Colombia (Mosquera, Cundinamarca, 1800–2000 m).
BIOLOGY Inhabits moist forest. In Costa Rica, nests under epiphytes *("innupta")*; in Colombia, under rocks. Obviously, many more nest site data are needed to establish the preferred nest sites of *alfaroi* and possible sibling species. Males and winged queens were found at El Volcán Chiriquí, Panama, on 24 June and a male near Mosquera, Colombia, on 30 June.

Compare with *accinota, cameroni, quiaccana*

FIGURE Upper: holotype, major. Lower: paratype, minor. ECUADOR: 6 km southeast of Pifo, Pichincha, 0°15′S 78°18′W, 2900 m (Philip S. Ward). Scale bars = 1 mm.



Pheidole alpestris **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *alpestris,* of high mountains.

DIAGNOSIS A small, brown member of the *diligens* group distinguished in both major and minor by the low mesonotal convexity, shallow metanotal depression in side view, and hence a more cylindrical form of the mesosoma overall in side view than is usual for *Pheidole*; a small convexity atop the metanotal depression in side view; large, robust propodeal spines; and dense erect to suberect pilosity over the entire body; pubescence absent.

Major: a secondary convexity on the pronotum and a small, angular subpostpetiolar process evident in side view.

Minor: ventral profile of head capsule flat in side view.

Very close to, and possibly synonymous with, *cameroni,* but distinguished by, among other traits, much denser pilosity and the absence of carinulae mesad to the eye in the major.

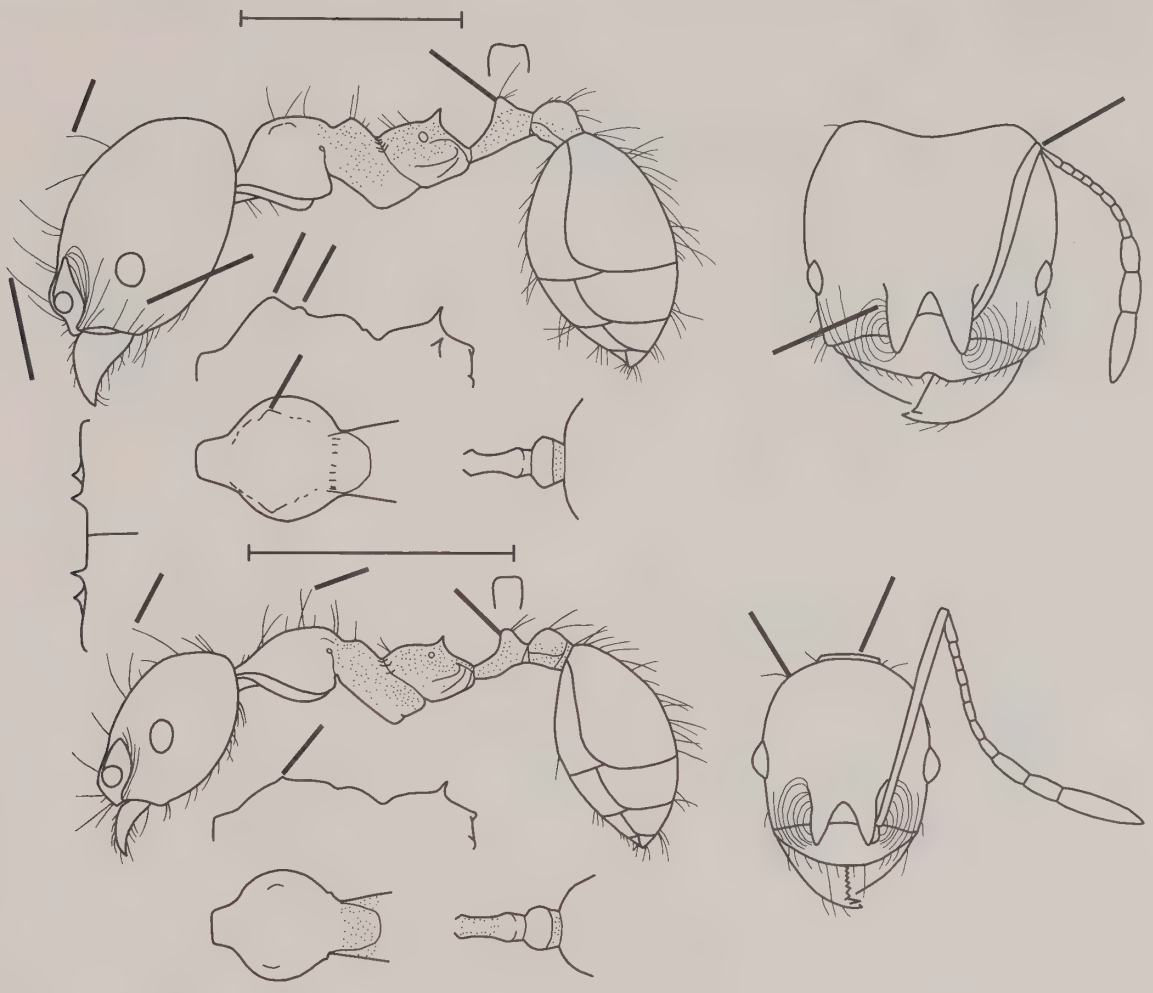
MEASUREMENTS (mm) Holotype major: HW 1.02, HL 1.02, SL 0.78, EL 0.20, PW 0.54.
Paratype minor: HW 0.54, HL 0.62, SL 0.44, EL 0.12, PW 0.34.

COLOR Major: concolorous medium brown.
Minor: concolorous light brown.

RANGE Known only from the type locality.

BIOLOGY Two colonies of the types were taken by Ward under a stone in *Baccharis* scrub, at roadside.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Ipiranga, São Paulo. Scale bars = 1 mm.



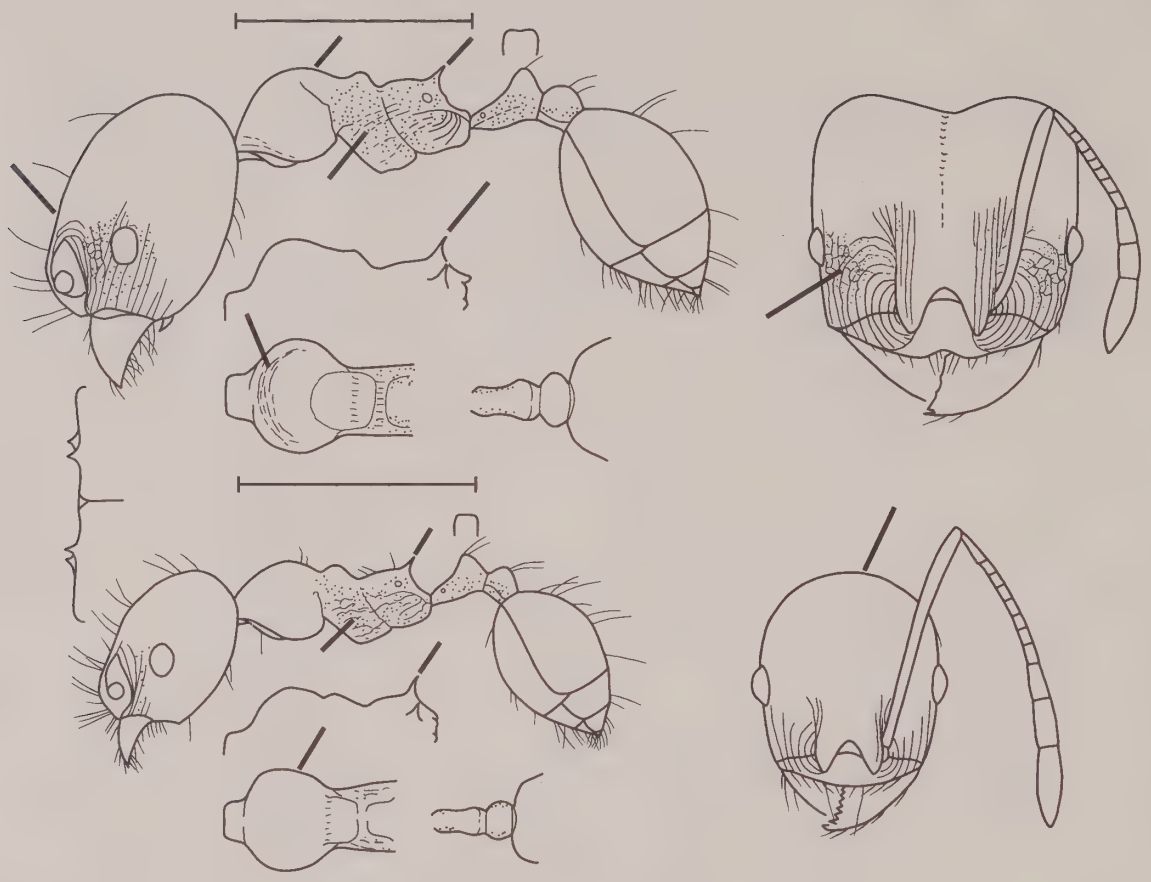
Pheidole angusta Forel

Pheidole angusta Forel 1908h: 373. Syn.: *Pheidole angusta* r. *idulis* Forel 1912g: 235, n. syn.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY L *angusta,* narrow, allusion unknown.
DIAGNOSIS A yellow, long-scaped member of the *diligens* group similar to *longiscapa,* differing as follows.
Major: dorsal surface of head with sparse long hairs, some longer than Eye Length; antennal scape approaching occipital corner within less than its own maximum width; carinulae of head not extending posteriorly beyond eyes; apex of petiolar node tapering to a near point in side view.
Minor: pilosity of dorsal surface of head and promesonotum sparse, long, some hairs longer than Eye Length; humerus in dorsal-oblique view denticulate; petiolar node in side view tapered almost to a blunt point; occiput with nuchal collar.
MEASUREMENTS (mm) Lectotype major: HW 1.12, HL 1.14, SL 0.84, EL 0.18, PW 0.52.
Paralectotype minor: HW 0.60, HL 0.74, SL 0.86, EL 0.14, PW 0.40.
COLOR Major and minor: concolorous medium yellow.
RANGE Recorded from São Paulo and Rio de Janeiro, Brazil.
BIOLOGY Unknown.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. HONDURAS: Minas Las Animas, above Valle de Angeles, Francisco Morazán, 1580 m (William L. Brown). Scale bars = 1 mm.



Pheidole anima **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the type locality.

DIAGNOSIS A brown member of the *diligens* group distinguished by the following combination of traits.

Major: posterior half of cephalic dorsum smooth; rugoreticular patches present mesad of eyes; outer (lateral) fourths of frontal lobes longitudinally carinulate; anterior strip of pronotum, all of mesopleuron, and part of sides of propodeum carinulate; promesonotum profile bilobate; mesosoma bare of pilosity.

Minor: mesopleuron and anterior half of side of propodeum rugulose; a few carinulae on dorsal surface of head, including margins of frontal lobes; rest of body smooth and shiny; occiput semicircular, with no nuchal collar.

Similar in various traits to *diligens, gagates, nubila, piceonigra, radoszkowskii, stigma,* and *triconstricta*.

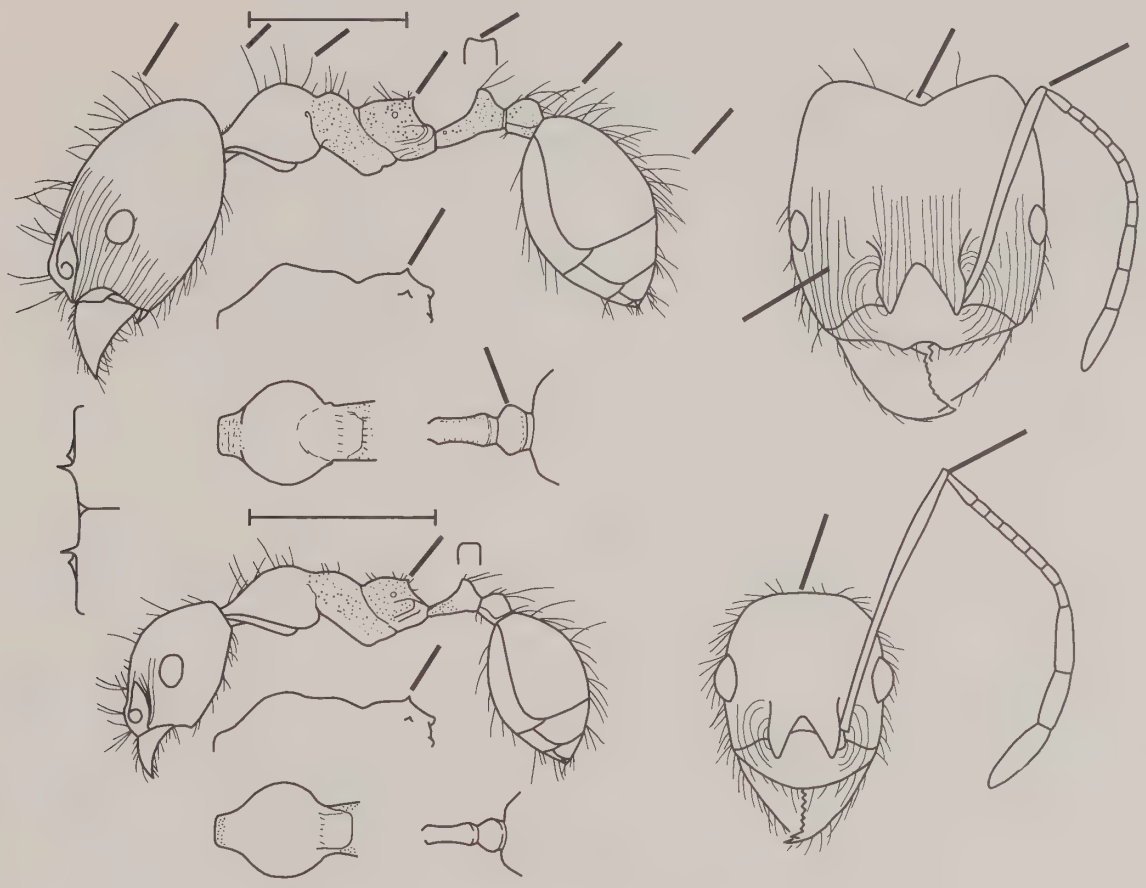
MEASUREMENTS (mm) Holotype major: HW 1.00, HL 1.00, SL 0.82, EL 0.20, PW 0.52.
Paratype minor: HW 0.52, HL 0.64, SL 0.74, EL 0.14, PW 0.38.

COLOR Major and minor: body medium to dark brown, appendages light brown.

RANGE Known only from the type locality.

BIOLOGY The type colony was found in a piece of rotten wood in a forested ravine.

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: 38 km south of Monclova, Puente La Muralla, Coahuila, 1280 m (Robert J. Hamton). Scale bars = 1 mm.

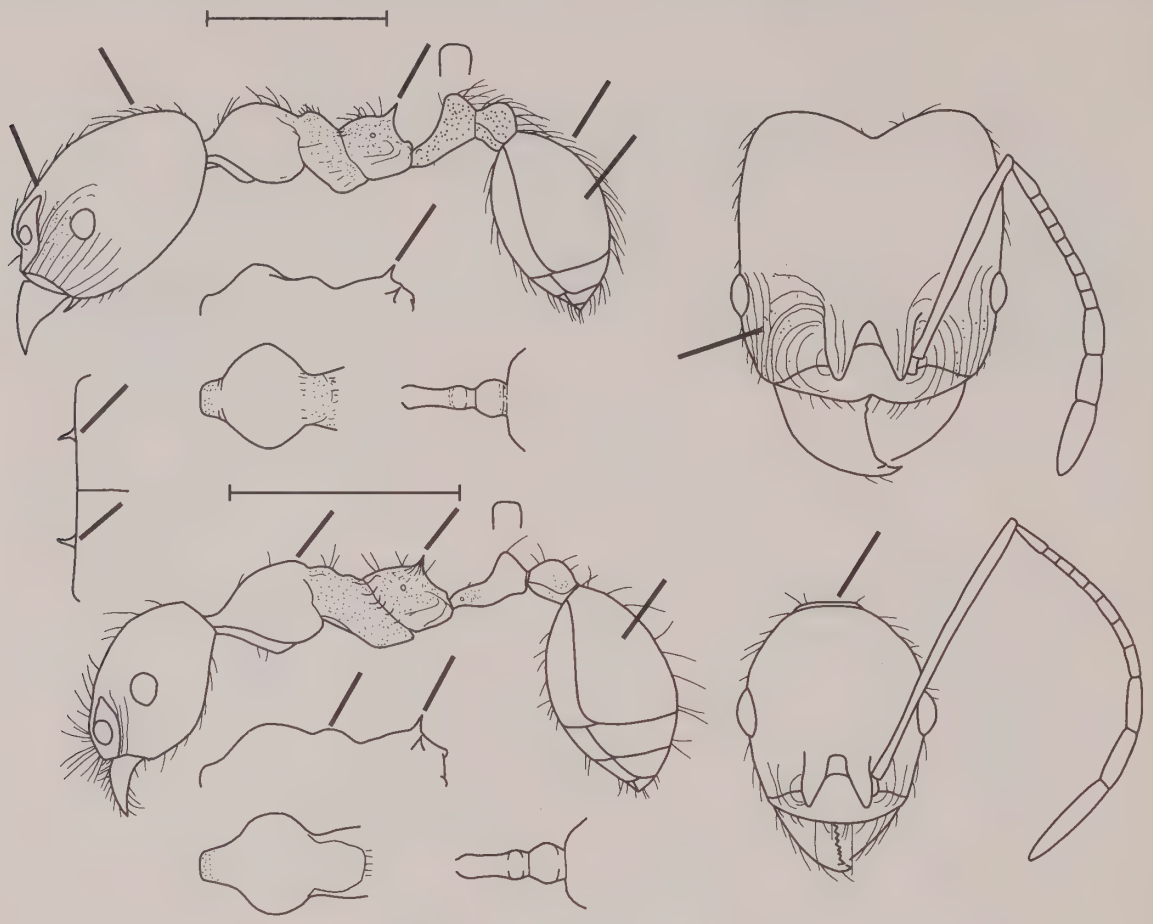


Pheidole ariel **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *ariel,* airy sprite, alluding to the slender, pale yellow bodies of both castes.
DIAGNOSIS Similar to *desertorum* and *vistana* (see also the less similar *hyatti*), distinguished from these members of the *fallax* group and other members of the *diligens* group as follows.
Major: pale to medium yellow; slender; antennal scape just reaching occipital border; occipital border deep, subangulate at midline; pilosity of body dorsum moderately abundant, suberect to erect, and very long; propodeal spine reduced to a denticle; pronotum and all of gaster smooth and shiny.
Minor: occiput broad and lacking nuchal collar; propodeal spine reduced to a denticle; carinulae limited to circular lines around antennal fossae; mesopleuron and side of propodeum foveolate and opaque; rest of body smooth and shiny.
MEASUREMENTS (mm) Holotype major: HW 1.46, HL 1.62, SL 1.34, EL 0.26, PW 0.72.
Paratype minor: HW 0.66, HL 0.82, SL 1.16, EL 0.22, PW 0.44.
COLOR Major: concolorous pale to medium yellow.
Minor: concolorous pale yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *biconstricta, plato,* and *socrates* in the *biconstricta* group

FIGURE Upper: syntype, major. Lower: syntype, minor. COSTA RICA: La Palma, 1600 m. Scale bars = 1 mm.



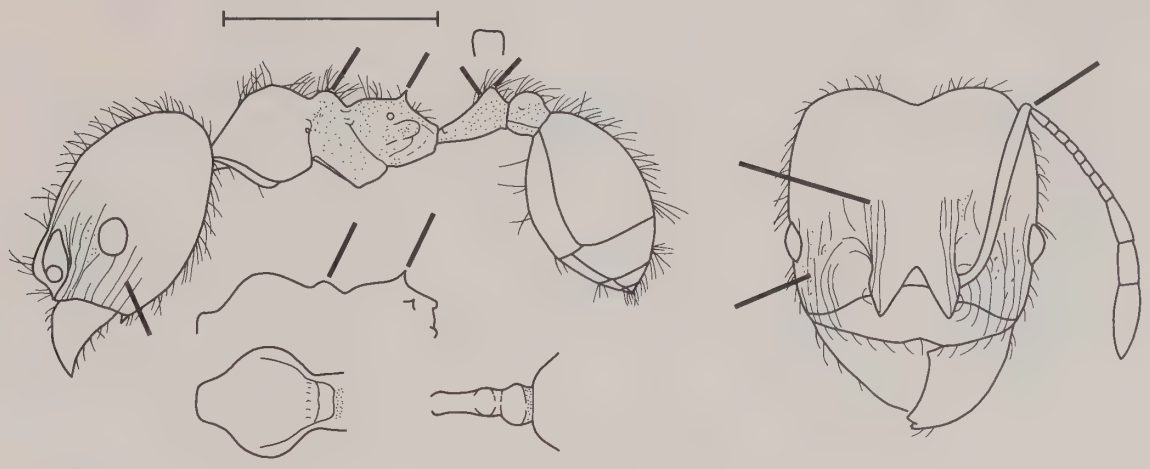
Pheidole biolleyi Forel

Pheidole biolleyi Forel 1908c: 48. Syn.: *Pheidole biolleyi tristani* Forel 1908c: 50, n. syn. The syntypes of *biolleyi* used in the figure, and which are housed in the Museum of Comparative Zoology, Harvard, are from La Palma, 1600 m. The type locality given by Forel is "Costa del Tablazo," which Longino (1997) suggests is the same as Cerro Tablazo, located at about 1500 m near Cartago. There are differences between my drawings of the La Palma specimens and Longino's photographs in the shapes of the head and postpetiole, but otherwise the series appear close and I am treating them as conspecific. The *tristani* syntypes (Mus. Hist. Nat. Genève) vary in head shape in the same way, and otherwise appear identical to the La Palma *biolleyi* syntypes.

TYPES Mus. Hist. Nat. Genève; Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the collector, Paul Biolley.
DIAGNOSIS This species appears to be intermediate between the *biconstricta* and *diligens* groups, and is therefore placed in the latter only tentatively. It is distinguished in the **major** by variable 2- or 4-dentate hypostoma (as in *biconstricta*), smaller size, absence of a rugoreticulum on the head, smooth first gastral tergite, and abundant, subappressed hairs on the first gastral tergite.
MEASUREMENTS (mm) Syntype major: HW 1.14, HL 1.22, SL 0.94, EL 0.16, PW 0.60.
Syntype minor: HW 0.64, HL 0.78, SL 1.00, EL 0.16, PW 0.44.
COLOR Major: concolorous light orange.
Minor: concolorous light brownish yellow.
RANGE *P. biolleyi* occurs in the upland Central Valley of Costa Rica around Cartago and Monteverde.
BIOLOGY According to Longino (1997), colonies of *biolleyi* inhabit cloud forests, where they nest in the soil. He has observed workers foraging both on the ground and in low vegetation.

Compare with *lemur, perryorum, pubiventris, rochai, seeldrayersi, vafra, variegata*

FIGURE Lectotype, major. BRAZIL: Blumenau, Santa Catarina. The minor is nearly identical to that of *rochai* (q.v.). Scale bar = 1 mm.



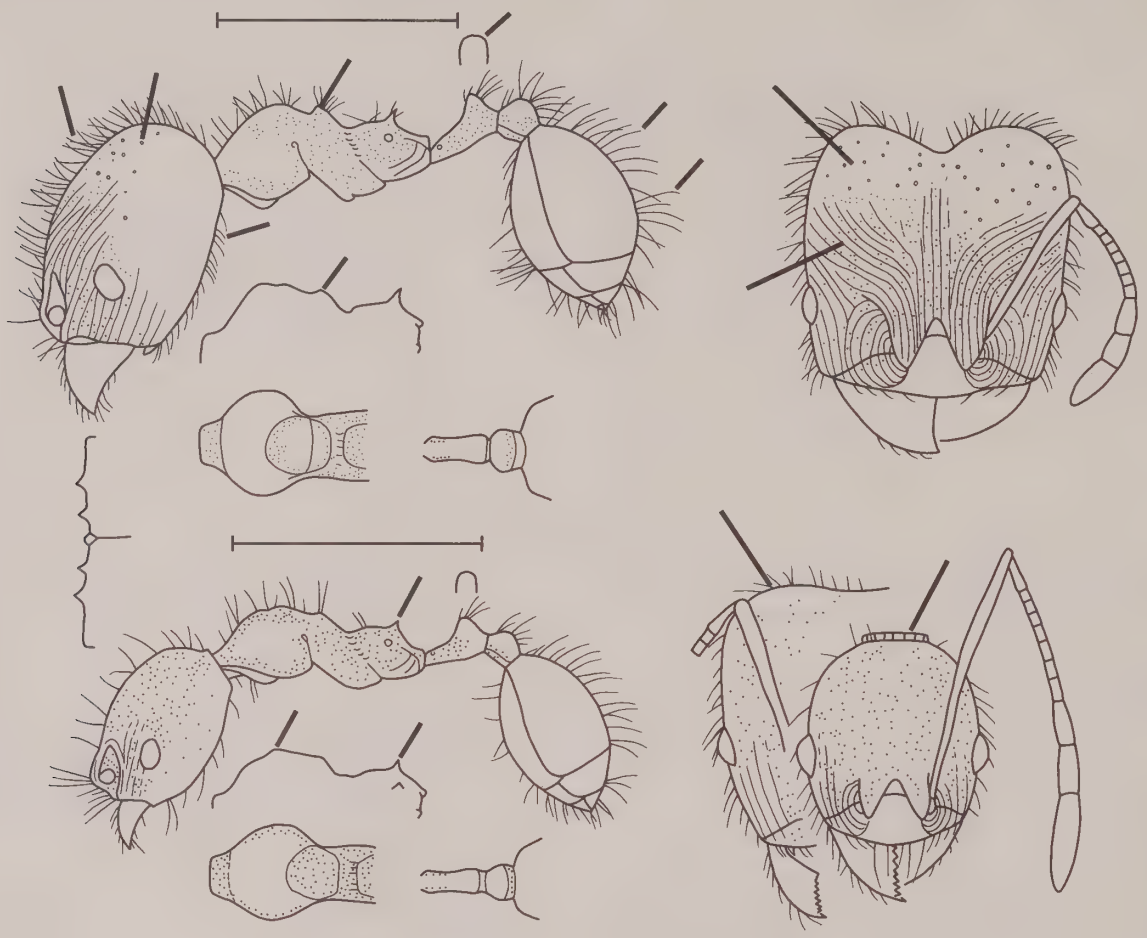
Pheidole blumenauensis Kempf

Pheidole blumenauensis Kempf 1964e: 64. Replacement name for *Pheidole diligens* Santschi 1923d: 50 (junior secondary homonym for *Atta diligens* F. Smith 1858a: 168, later transferred to *Pheidole*).

TYPES Naturhist. Mus. Basel.
ETYMOLOGY L *blumenauensis,* after the type locality.
DIAGNOSIS A small, reddish brown member of the *diligens* group, whose **major** has a moderately prominent mesonotal convexity, which is part of a bilobed promesonotal outline as seen in dorsal-oblique view; short, nearly equilaterally triangular propodeal spines; overall mostly smooth and shiny body surface with sculpturing on the head composed exclusively of longitudinal carinulae confined to the anterior half; and abundant, medium-length, erect pilosity.
Close to *rochai* and *vafra,* but differing variously in head shape, eye size, sculpturing, and color.
See also the less similar *lemur, perryorum, pubiventris, seeldrayersi,* and *variegata,* as illustrated.
Minor: virtually identical to that of *rochai,* as illustrated (q.v.).
MEASUREMENTS (mm) Lectotype major: HW 0.96, HL 1.00, SL 0.78, EL 0.20, PW 0.54.
Paralectotype minor: HW 0.52, HL 0.64, SL 0.78, EL 0.16, PW 0.38.
COLOR Major: concolorous reddish brown.
Minor: body light brown, appendages brownish yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *aculifera* (in the *fallax* group), and *prostrata, variegata, violacea*

FIGURE Upper: holotype, major. Lower: paratype, minor, and partial head of media. COSTA RICA: Monteverde, Puntarenas, 10°18′N 84°48′W, 1500 m (J. T. Longino). Scale bars = 1 mm.



Pheidole boruca **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the Boruca Amerindians, one of the surviving native tribes of Costa Rica.

DIAGNOSIS **Major**: carinulae originating on the frontal lobes curve laterally above the eyes, many reaching the lateral margins of the head seen in full-face view; posterior quarter of dorsal surface of head, including occiput, covered by scattered conspicuous foveae. **Media** caste present in type series (a possible developmental anomaly). Similar to *violacea* of Costa Rica, especially in the peculiar pattern of cephalic carinulae, but nests on the ground (instead of in arboreal ant gardens), lacks the bluish reflections on the body of the **minor**, has a media caste, and is different in the major and minor castes in many details of body form, sculpturing, and pilosity as illustrated. See also the less similar *aculifera* (in the *fallax* group), *prostrata,* and *variegata*.

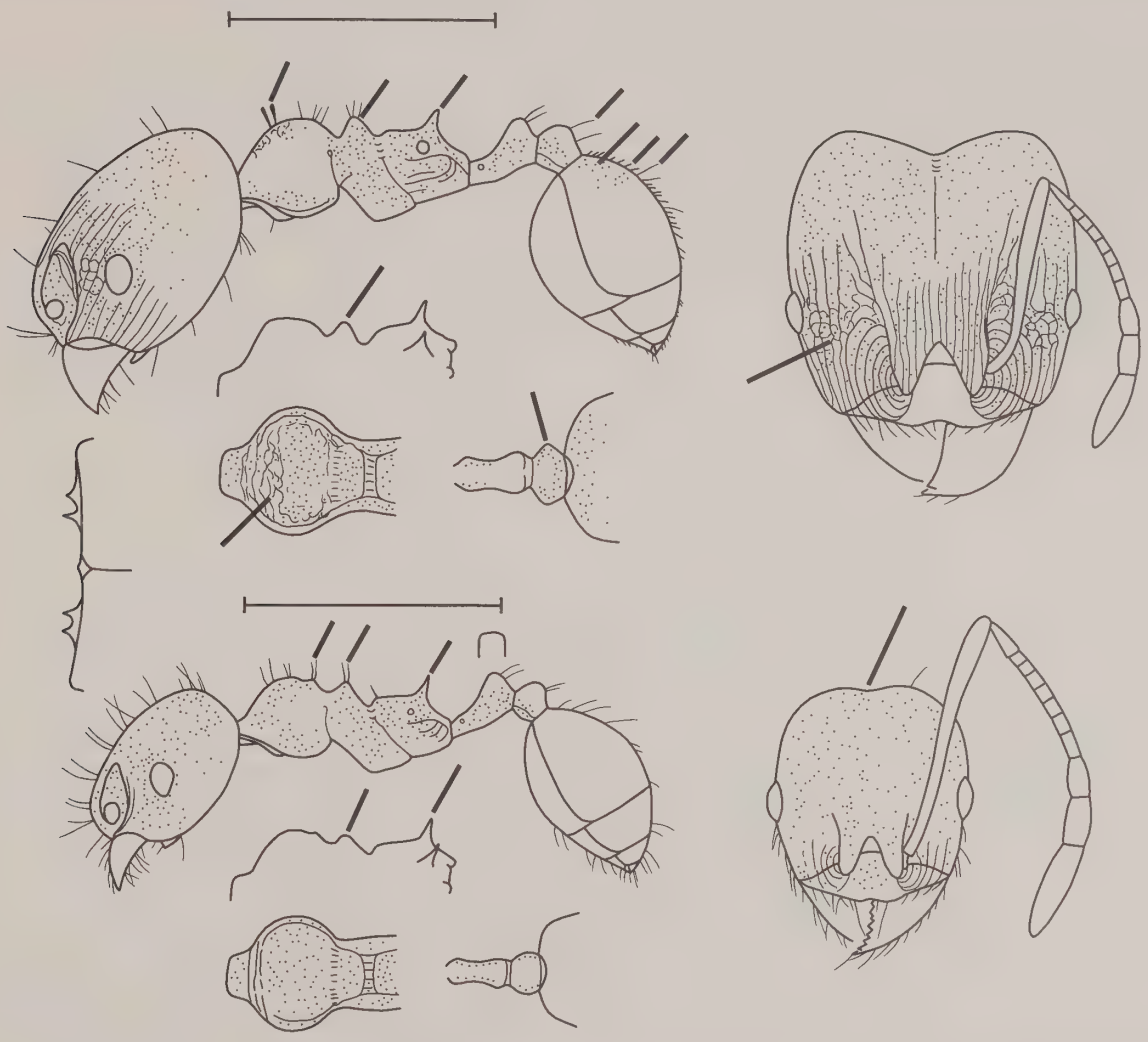
MEASUREMENTS (mm) Holotype major: HW 1.10, HL 1.10, SL 0.78, EL 0.20, PW 0.48.
Paratype minor: HW 0.54, HL 0.66, SL 0.84, EL 0.12, PW 0.36.

COLOR Major: body dark, almost blackish brown; appendages medium brown.
Minor: body blackish brown, appendages medium brown.

RANGE Atlantic slope and montane regions of Costa Rica (Longino 1997).

BIOLOGY Longino (1997): very common in Winkler samples from mature wet forest, from 50 m elevation at La Selva Biological Station to cloud forest in the Talamancas and at Monteverde. Longino found nests under pieces of dead wood on the ground, and observed workers foraging on the ground day and night.

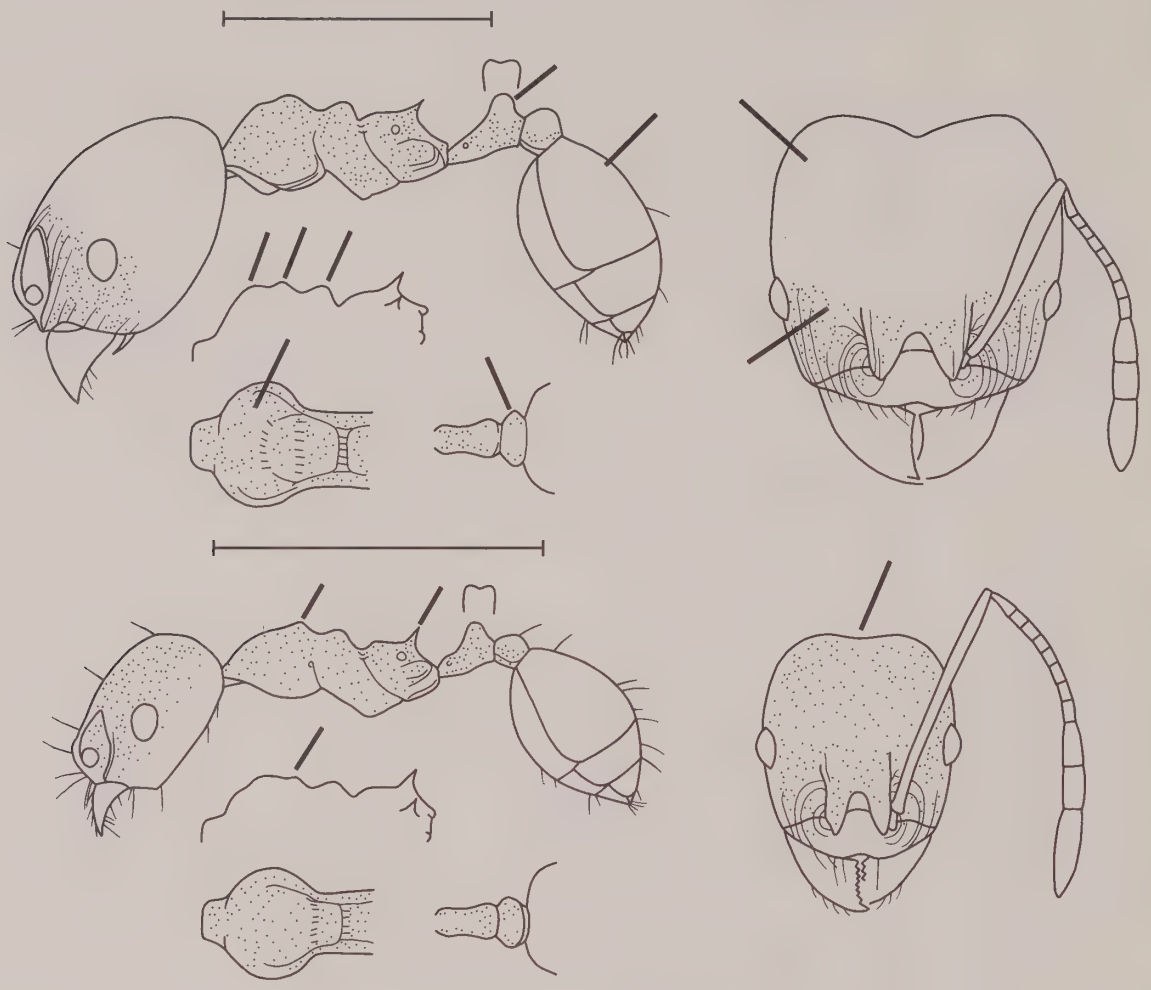
FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Mun. Buenaventura (Bajo Calima, Villa Clara), Valle (William L. Brown and Richard B. Root). Scale bars = 1 mm.



Pheidole brandaoi **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named in honor of the distinguished Brazilian myrmecologist C. Roberto F. Brandão.
DIAGNOSIS A unique yellow member of the *diligens* group similar to *perdiligens* and *radoszkowskii,* but distinguished from these and other species of the group as follows.
Major: with sparse pilosity on the mesosomal dorsum, including a pair of clavate hairs on the pronotum; pilosity on gastric tergites consisting of a carpet of short suberect pubescence in addition to longer erect to suberect hairs; no hairs on profile of head in full face except clypeus; mesosomal convexity very large, and subtriangular in side view; rugoreticula present between eyes and antennal fossae, and on anterior half of pronotum.
Minor: all of head, except frontal triangle, and most of mesosoma, foveolate and opaque; propodeal spines long and stout.
MEASUREMENTS (mm) Holotype major: HW 0.96, HL 1.00, SL 0.70, EL 0.18, PW 0.52.
Paratype minor: HW 0.60, HL 0.66, SL 0.76, EL 0.14, PW 0.44.
COLOR Major: body and mandibles dark yellow, other appendages light yellow.
Minor: concolorous medium yellow.
RANGE Known only from the type locality.
BIOLOGY The type series was collected in lowland rainforest.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. GRENADA, WEST INDIES: Grand Etang (Charles T. Brues). Scale bars = 1 mm.



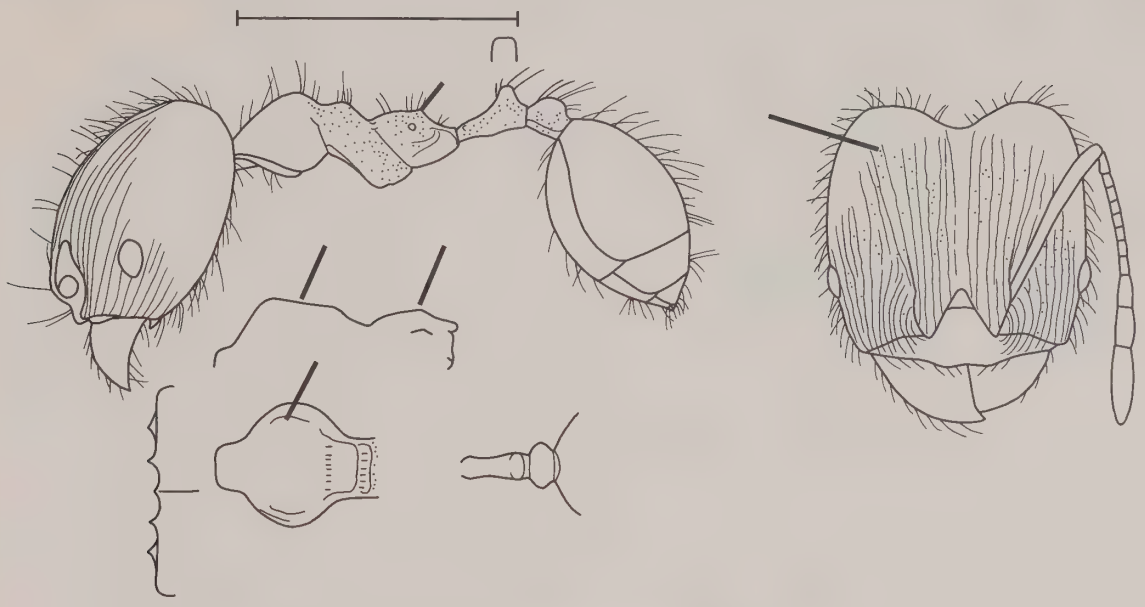
Pheidole bruesi Wheeler, **new status**

Pheidole triconstricta var. *bruesi* Wheeler 1911b: 169.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the collector, the entomologist Charles T. Brues.
DIAGNOSIS A small, yellow, nearly hairless member of the *diligens* group, similar to *diligens, inversa, laidlowi, radoszkowskii,* and *triconstricta,* and differing by the following combination of traits.
Major: cephalic sculpturing consisting exclusively of longitudinal carinulae and foveolae, which are usually confined to the dorsal surface anterior to the posterior margin of the eyes; promesonotal profile 3-lobed; petiolar node thick; lateral margins of postpetiolar node subangular; gaster entirely smooth and shiny.
Minor: promesonotal profile 3-lobed. The Grenada series collected by Stefan Cover and me are variable, especially in the amount of cephalic sculpturing. A series nearly identical to the Grenadan population was collected by William L. Brown between Manaus and Itacoatiara, Amazonas, Brazil; it differs from the Grenada *bruesi* types only in the convex occiput (frontal view) and convex petiolar dorsal border (rear view) of the minor. Thus the status of *bruesi* as a Grenadan or even West Indian endemic is in doubt.
MEASUREMENTS (mm) Lectotype major: HW 0.98, HL 1.00, SL 0.72, EL 0.20, PW 0.46.
Paralectotype minor: HW 0.52, HL 0.60, SL 0.66, EL 0.12, PW 0.34.
COLOR Major and minor: yellow.
RANGE Known only from Grenada and, probably, Amazonian Brazil (see Diagnosis).
BIOLOGY At La Sagesse Bay, Stefan Cover and I found *P. bruesi* abundant in dry, semi-deciduous scrub woodland, nesting in soil covered by thin leaf litter. At Fort Jeudy, a nest was found in dry deciduous forest, in a small rotting stump with galleries extending downward into the soil. In a nutmeg grove at Concord Falls, we found nests common in the soil. A nest excavated at Sagesse Bay contained a single queen. Majors and minors were readily attracted to baits, following odor trails laid by individually foraging scout workers. A male was collected in a nest on Grenada by C. T. Brues in September.

Compare with *cataractae, demeter, machetula, scimitara, sicaria, tenuis*

FIGURE Holotype, major. (Minor not figured.) COLOMBIA: Mun. Buenaventura (Bajo Calima), Valle (William L. Brown and Richard B. Root). Scale bar = 1 mm.



Pheidole calimana **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the geographical origin of the type colony.

DIAGNOSIS **Major**: distinguished in the *diligens* group by small size, slender body form, and especially by a smooth and shiny pronotum and weak foveolation and feebly shiny to subopaque intercarinular spaces on the head.

Minor: in particular head foveolate and propodeum dentate, as opposed to head smooth and shining and propodeum rounded in *cataractae*.

Major and **minor**: propodeal spines reduced to denticles.

Close to *cataractae,* with differences in the propodeal spine and cephalic sculpturing as illustrated.

MEASUREMENTS (mm) Holotype major: HW 0.92, HL 0.94, SL 0.72, EL 0.14, PW 0.44.

Paratype minor: HW 0.44, HL 0.54, SL 0.70, EL 0.12, PW 0.30.

COLOR Major: gaster light to medium brown; rest of body and appendages brownish yellow.

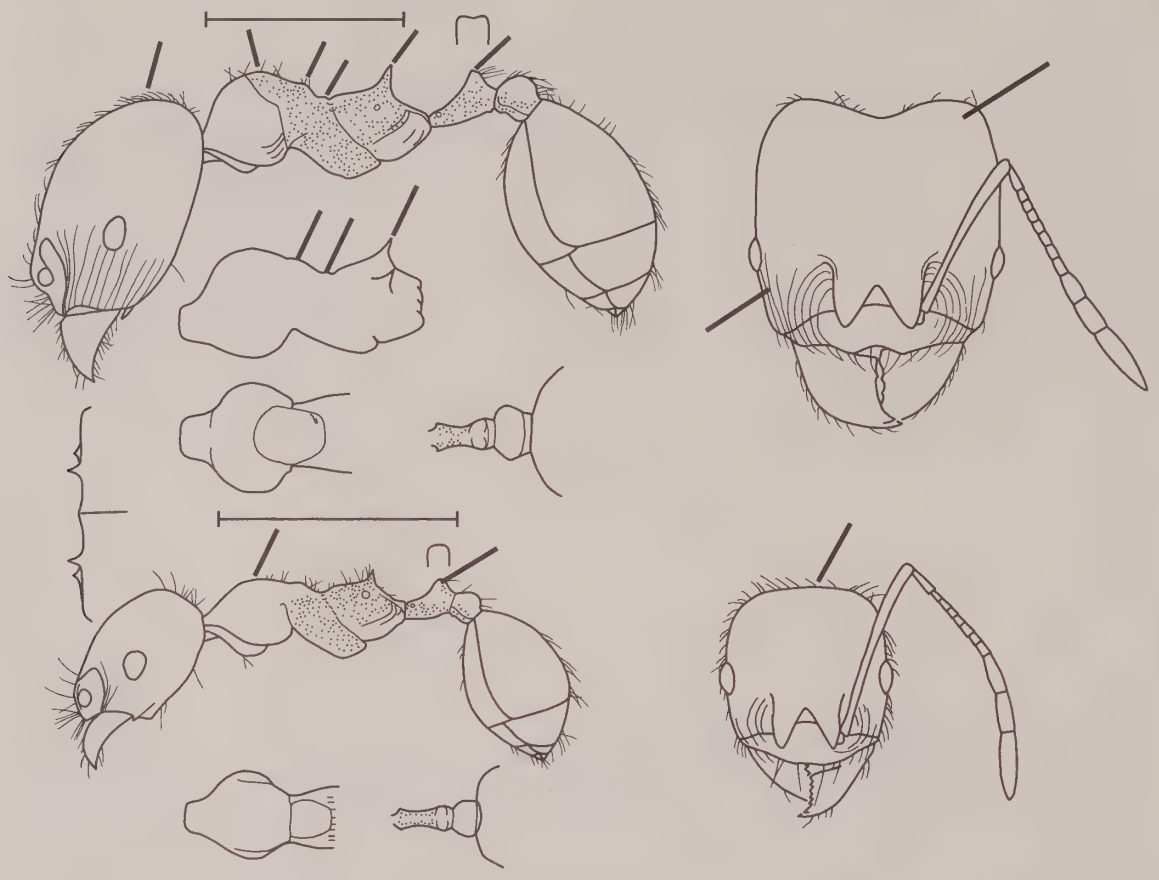
Minor: concolorous dark yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

Compare with *accinota, alpestris, quiaccana*

FIGURE Upper: lectotype, major. Lower: paralectotype minor. ECUADOR: Riobamba ("De Penipe a Riobamba"). Scale bars = 1 mm.

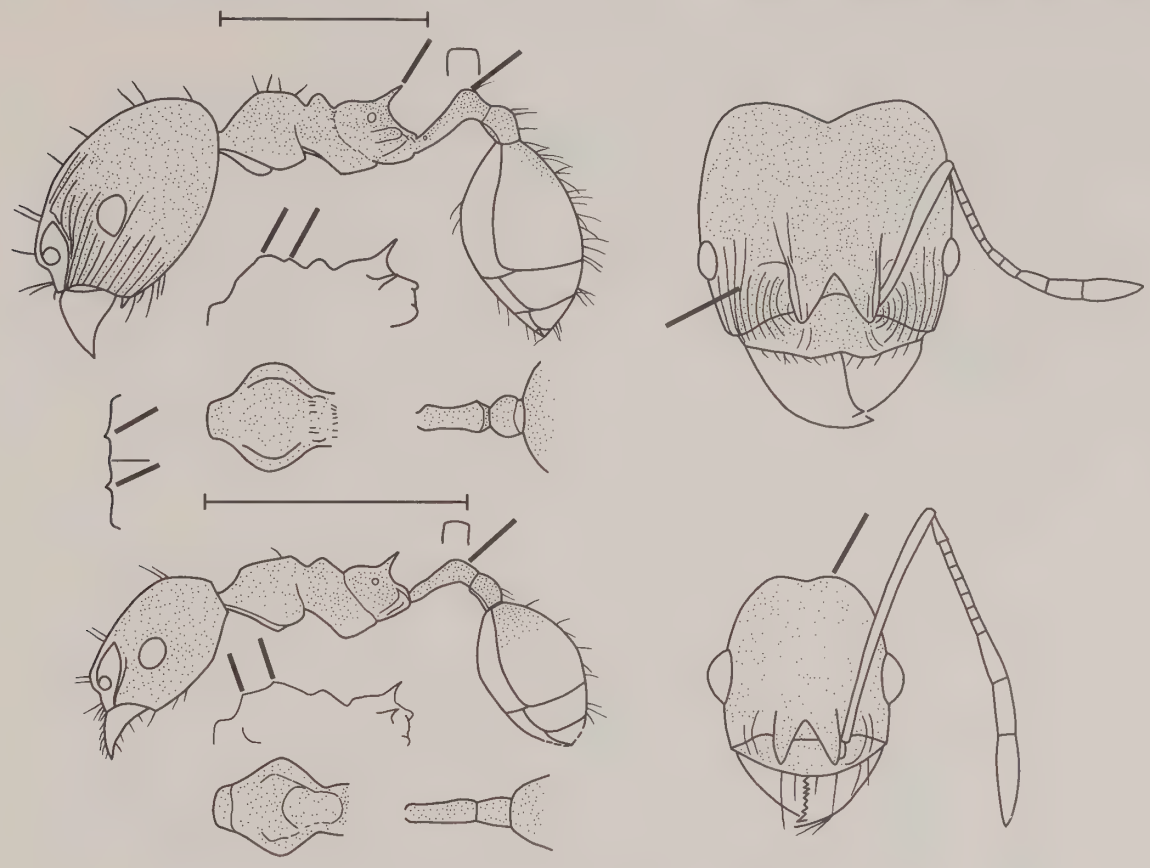


Pheidole cameroni Mayr

Pheidole cameroni Mayr 1887: 593. Syn.: *Pheidole monticola* Cameron 1892: 67.

TYPES Naturhist. Mus. Wien.
ETYMOLOGY Named after the collector, P. Cameron.
DIAGNOSIS A small, light brown member of the *diligens* group distinguished in both **major** and **minor** by low mesonotal convexity, shallow metanotal depression in side view, and hence a more cylindrical form of the mesosoma in side view than is usual for *Pheidole*; a small convexity atop the metanotal depression in side view; and large, robust propodeal spines. Especially similar to *alpestris,* but with much less dense and more subrecumbent pilosity in both **major** and **minor**, carinulae present mesad to the eye of the **major**, pronotal convexity absent in side view in **major**, and other traits as illustrated.
MEASUREMENTS (mm) Lectotype major: HW 1.14, HL 1.14, SL 0.82, EL 0.20, PW 0.60.
Paralectotype minor: HW 0.60, HL 0.66, SL 0.64, EL 0.12, PW 0.34.
COLOR Major: concolorous light to medium brown.
Minor: body and mandibles concolorous light brown; other appendages brownish yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: paratype, major. Lower: paratype, minor. BRAZIL: Utiariti, Rio Papagaio, Amazonas. Scale bars = 1 mm.

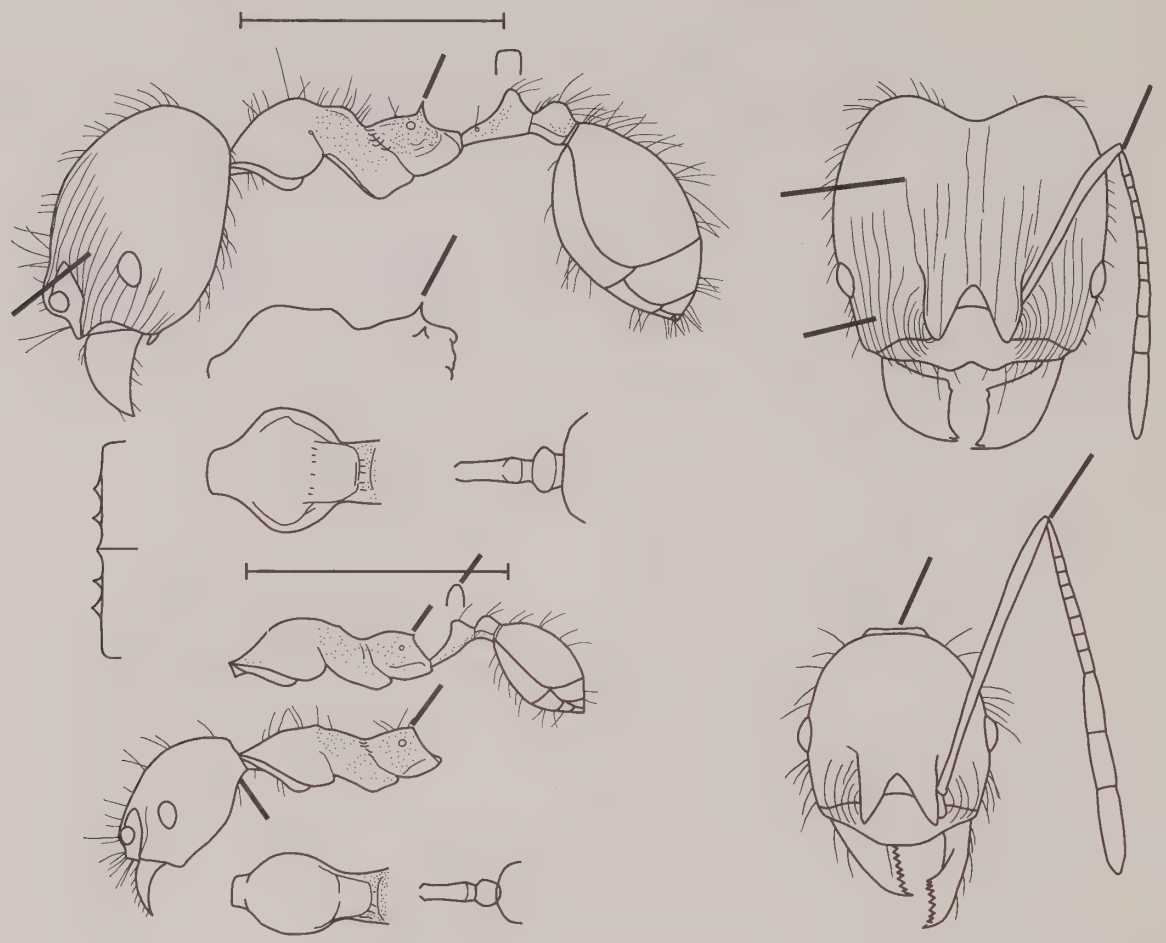


Pheidole camptostela Kempf

Pheidole camptostela Kempf 1972d: 457.

TYPES Mus. Zool. Univ. São Paulo.
ETYMOLOGY Gr *camptostela,* bent column, referring to the aberrant petiole.
DIAGNOSIS With *P. cyrtostela,* unique within *Pheidole* for the sharply bent petiole and depressed petiolar node, as seen from the side, in both **major** and **minor**. Distinguished from *cyrtostela* by the more exaggerated form of the petiolar modification, the absence of rugoreticula on the head of the **major**, and the narrowed occiput of the **minor**.
MEASUREMENTS (mm) Paratype major: HW 0.94, HL 0.96, SL 0.74, EL 0.20, PW 0.50.
Paratype minor: HW 0.44, HL 0.56, SL 0.64, EL 0.14, PW 0.34.
COLOR Major: concolorous light reddish brown.
Minor: concolorous yellowish red except for gaster, which is plain medium brown.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor, on top; and head, mesosoma, and waist, a minor from Fazenda Dimona, 90 km north of Manaus, Brazil (E. O. Wilson). (Type locality: Kaieteur, Guyana.) Scale bars = 1 mm.

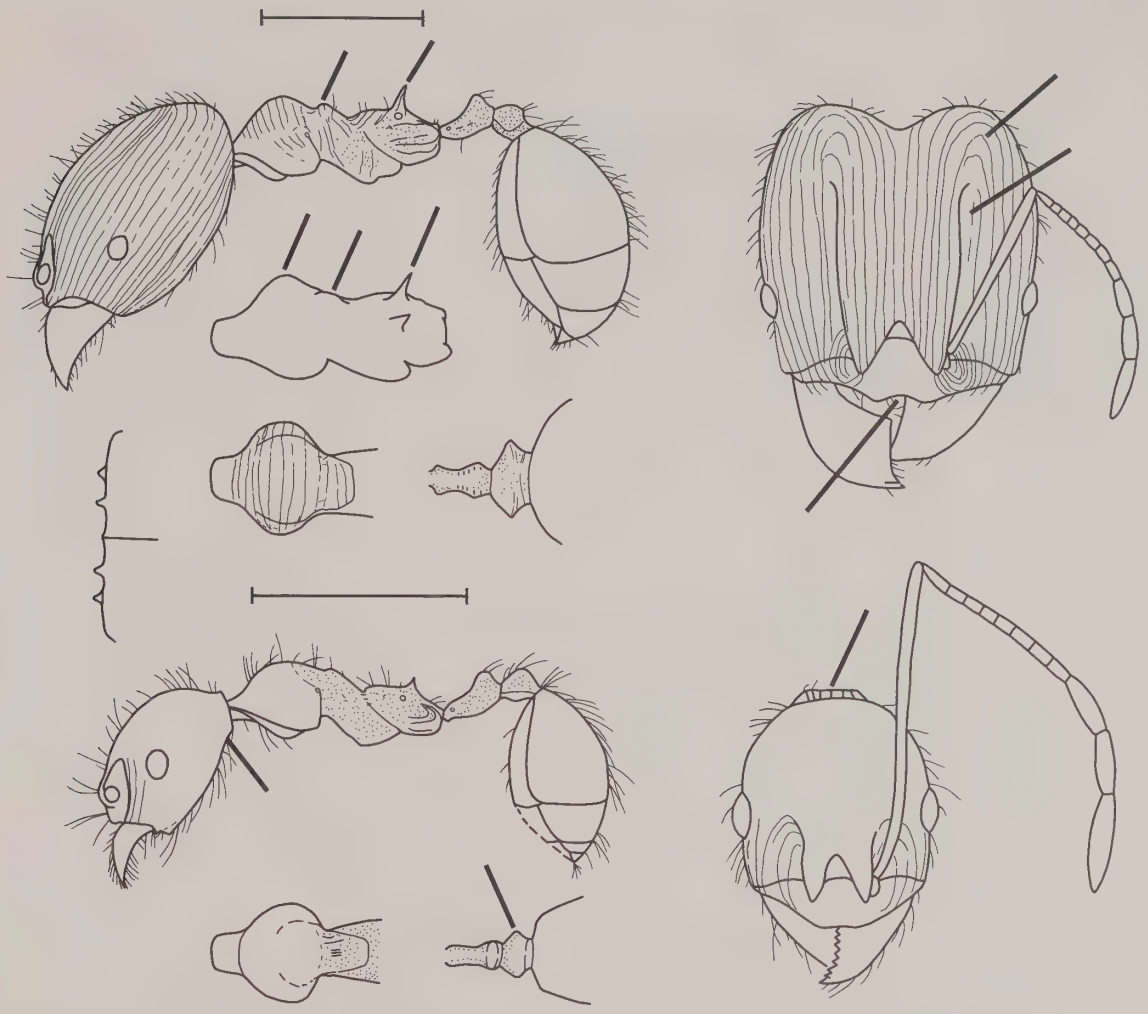


Pheidole cataractae Wheeler

Pheidole cataractae Wheeler 1916c: 6.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *cataract,* waterfall, alluding to the Kaieteur Fall, at the type locality.
DIAGNOSIS A brown, unusually small and slender member of the *diligens* group.
Major: body mostly smooth and shiny, with portions of mesosoma and propodeum foveolate, and with widely spaced longitudinal carinulae over part of dorsal head surface, their interspaces foveolate or smooth and shiny.
Minor: very slender; propodeal spines reduced to denticles.
A **media**, possibly a developmental anomaly, was found in a series from Cuzco Amazónico, in Amazonian Peru.
Close to *calimana,* distinguished from that species by its well-developed propodeal spines and shorter cephalic carinulae in the **major** and smooth, shiny head in the **minor**.
MEASUREMENTS (mm) Lectotype major: HW 0.94, HL 0.94, SL 0.76, EL 0.14, PW 0.44.
Paralectotype minor: HW 0.42, HL 0.50, SL 0.64, EL 0.10, PW 0.28.
COLOR Major: body medium brown, with mandibles and anterior quarter of head capsule dark yellowish brown; antennae and legs medium yellowish brown.
Minor: body concolorous light brown, appendages a lighter shade of yellowish brown.
RANGE Known from one locality each in Guyana, north of Manaus in Brazil, and Cuzco Amazónico, near Puerto Maldonado, Madre de Dios, Peru.
BIOLOGY Nests in pieces of rotting dead wood on the floor of rainforest. A media (minor-major intercaste) was found in the Peruvian series. Having studied a colony I collected north of Manaus and maintained in the laboratory, I agree with the following assessment by Stefan Cover (personal communication), based on his experiences at Cuzco Amazónico: "*P. cataractae* belongs to a small guild of rainforest *Pheidole* characterized by agile, fast-moving workers and soldiers [majors] with relatively long appendages; it nests in ephemeral sites on the forest floor and finds food sources rapidly, but retreats if competition shows up." The adaptation represents a behavioral (and in long appendages, anatomical) convergence to many species of the formicine genus *Paratrechina*.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. CHILE: no further data. Scale bars = 1 mm.



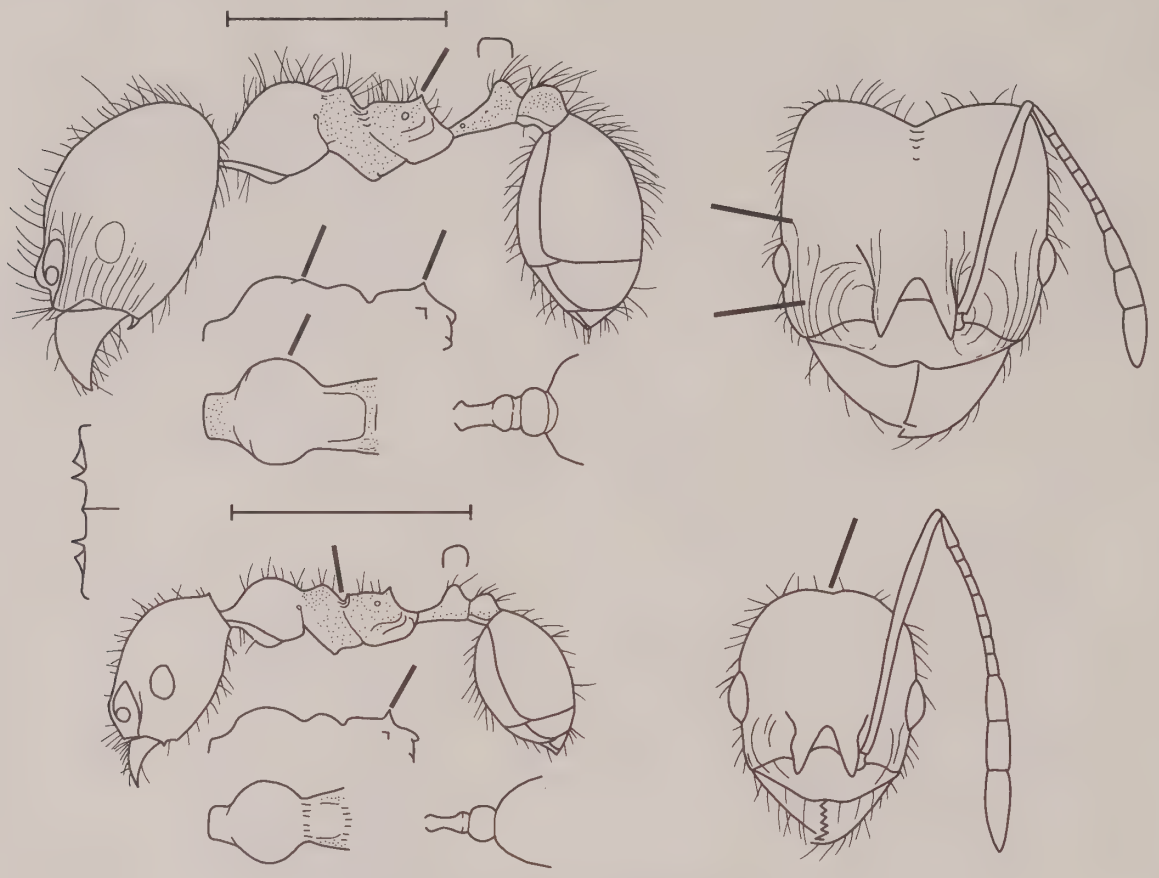
Pheidole chilensis Mayr

Pheidole chilensis Mayr 1862: 748.

TYPES Naturhist. Mus. Wien.
ETYMOLOGY Named after the country of origin.
DIAGNOSIS An unusual species, placed in the *diligens* group but also reminiscent of *teneriffana,* an exotic native to Mediterranean area. *P. chilensis* may also prove to be an exotic.
Major: lacking the 4-lobed profile and broad, convex metanotum of *teneriffana*; dorsal surface of the head covered by carinulae except for frontal triangle and midclypeus; carinulae originating on the frontal lobes spread outward as they approach the occiput and then travel back to return to the anterior part of the head in parallel; antennal scrobes present; anterior midclypeal margin excavated; postpetiole from above conulate; all of promesonotum transversely carinulate.
Minor: occiput narrowed and with nuchal collar; postpetiole from above diamond-shaped.
Both castes have abundant, erect hairs on the antennal scapes.
MEASUREMENTS (mm) Lectotype major: HW 1.46, HL 1.48, SL 0.94, EL 0.22, PW 0.62 (may be distorted by pin through pronotum).
Paralectotype minor: HW 0.60, HL 0.76, SL 0.94, EL 0.14, PW 0.40.
COLOR Major: body light reddish yellow, gaster light yellowish brown.
Minor: concolorous yellow.
Majors and minors collected in Lima in 1961 are medium reddish brown.
RANGE Known from the type collection from Chile; I have further compared a 1961 series from Lima, Peru, with the Mayr types.
BIOLOGY Unknown.

Compare with *aenescens, bergi, cordiceps, midas, nesiota*

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: Taperinha, Santarem, Pará (Robert L. Jeanne). Scale bars = 1 mm.



Pheidole chrysops **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *chrysops,* like gold, referring to the dark yellow color of the major.

DIAGNOSIS A small, yellow species tentatively placed in the *diligens* group but with clear ties to some members of the *fallax* group, i.e., *aenescens, bergi, cordiceps,* and *midas,* from which it is distinguished by the following set of traits.

Major: head heart-shaped, but with occipital angles in full-face view tending toward subangulate; propodeal spine short, equilaterally triangular; pronotal profile in dorsal-oblique view slightly bilobous; pilosity long and dense; head lacking rugoreticulum, and carinulae limited to anterior half of head with frontal lobes mostly bare.

Minor: occiput narrowed but lacking nuchal collar; in profile, mesonotum moderately convex.

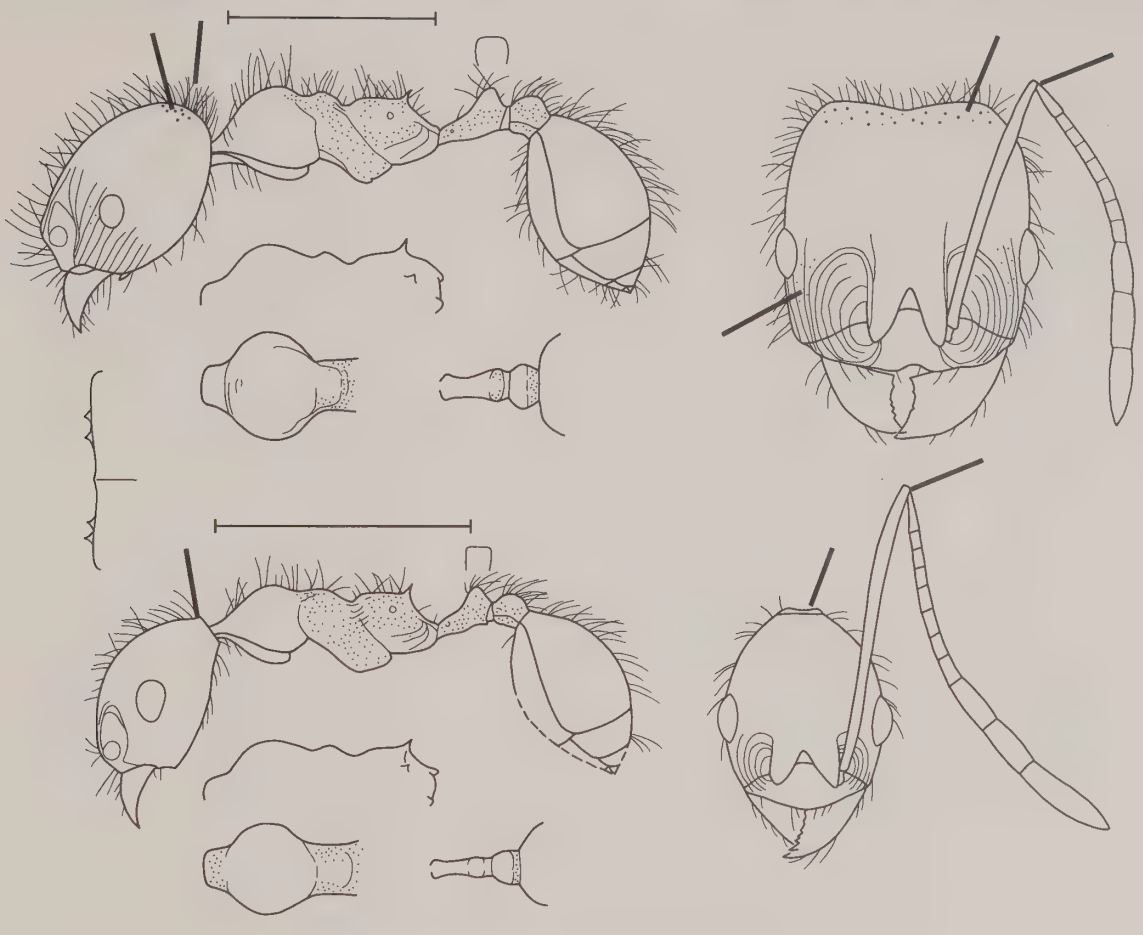
MEASUREMENTS (mm) Holotype major: HW 0.94, HL 0.96, SL 0.74, EL 0.18, PW 0.52.
Paratype minor: HW 0.46, HL 0.54, SL 0.66, EL 0.12, PW 0.34.

COLOR Major: concolorous dark ("golden") yellow.
Minor: clear medium yellow.

RANGE Known from the type locality and from a single series, nearly identical to the types, from Reserva Mbaracayú, Jejuimi, Dept. Canindeyú, Paraguay.

BIOLOGY The Paraguay colony was in a nest in leaf litter in "high forests" (Alex Wild).

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. SURINAME: Paramaribo. Scale bars = 1 mm.



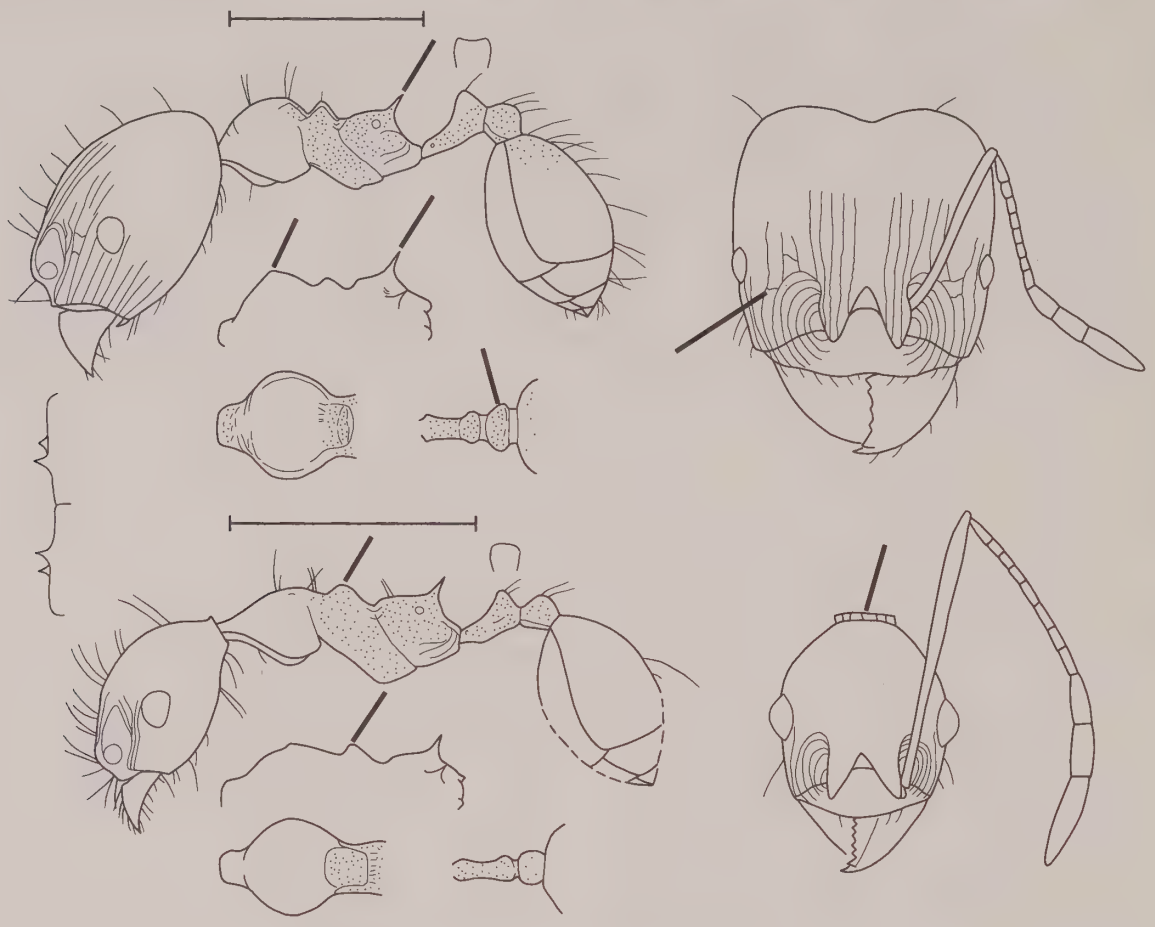
Pheidole cocciphaga Borgmeier

Pheidole cocciphaga Borgmeier 1934: 99.

TYPES Mus. Zool. Univ. São Paulo.
ETYMOLOGY L Gr *cocciphaga,* eater of *coccum,* or scale insect.
DIAGNOSIS A slender, small-headed member of the *diligens* group distinguished by the following combination of traits.
Major: head small relative to body and with a "crown" on the occiput of dense foveae and tuft of erect to suberect medium-length hair; antennal scape exceeding the occipital corner by over 2× the scape's maximum width.
Minor: head elliptical in full-face view, with nuchal collar; antennal scape exceeds occipital border by half its own length.
MEASUREMENTS (mm) Lectotype major: HW 0.88, HL 0.92, SL 0.92, EL 0.20, PW 0.50.
Paralectotype minor: HW 0.54, HL 0.70, SL 0.94, EL 0.16, PW 0.40.
COLOR Major: light reddish brown.
Minor: brownish yellow.
The color varies in both castes to dark brown.
RANGE I have verified records of this unusual species from Nicaragua (Kukra River), Colombia, Guyana, Suriname, and Puerto Rico (Guanica). In addition, Longino (1997) reports it from southwestern and northeastern Costa Rica. Because it occurs at least occasionally in disturbed habitats (see below), the population in Puerto Rico may be an adventive carried accidentally by human commerce.
BIOLOGY In Costa Rica, Longino (1997) found *cocciphaga* in mature rainforest at La Selva, near Puerto Viejo, and on vegetated land close to the beach at Llorona, Corcovado National Park. One of the latter colonies was on a vegetated rock island separated from the nearby mainland by a shallow marine channel.

Compare with *laevifrons, mooreorum, pubiventris, seeldrayersi, variegata, zelata*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. SURINAME: Paramaribo. Scale bars = 1 mm.

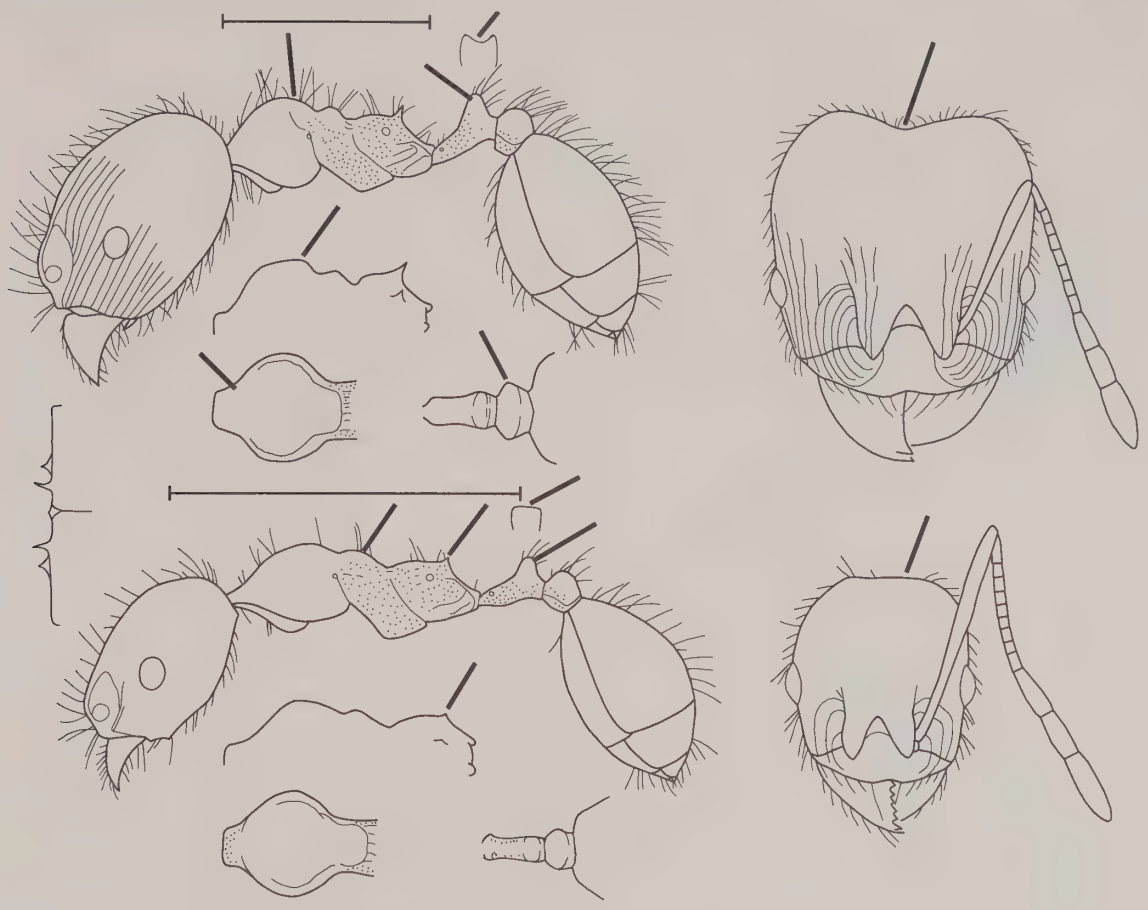


Pheidole coffeicola Borgmeier

Pheidole coffeicola Borgmeier 1934: 98.

TYPES Mus. Zool. Univ. São Paulo; Mus. Comp. Zool. Harvard.
ETYMOLOGY L *coffeicola,* living with coffee, referring to the coffee plantation where the type colony was collected.
DIAGNOSIS A medium-sized, dark yellow species close to *variegata* (q.v.), and possibly synonymous, differing in the **major** in its more protuberant, subangular humerus, shorter postpetiolar node, much less extensive rugoreticulum on the head, and color. *P. coffeicola* may also be distinguished by the presence of abundant short, decumbent hairs (and no erect hairs) in the **minor**. See also less similar *laevifrons, mooreorum, pubiventris, seeldrayersi,* and *zelata*.
MEASUREMENTS (mm) Lectotype major: HW 1.22, HL 1.16, SL 0.84, EL 0.20, PW 0.56.
Paralectotype minor: HW 0.56, HL 0.74, SL 0.96, EL 0.14, PW 0.40.
COLOR Major and minor: concolorous dark yellow.
RANGE Suriname, also recorded by Kempf (1972b) from Pará, Brazil.
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Chaclacayo, Lima (R. H. Crozier). Scale bars = 1 mm.

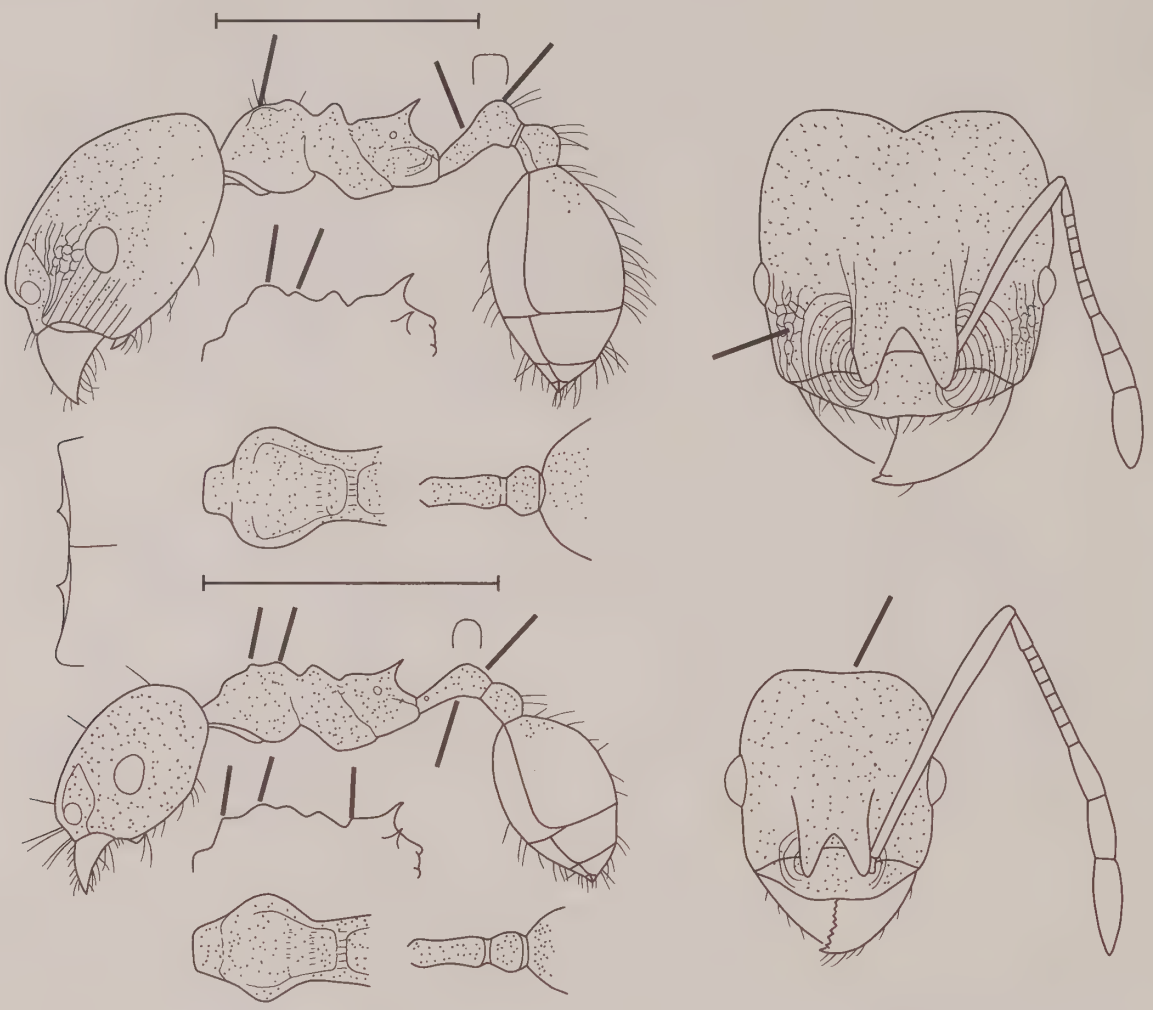


Pheidole crozieri **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the collector, the distinguished Australian myrmecologist Ross H. Crozier.
DIAGNOSIS A light brown member of the *diligens* group, closest to *williamsi* of the Galápagos Islands but also with some similarities to *vafella,* as well as *rufipilis* and the mostly South American species listed with *rufipilis* (q.v.), differing from *williamsi* as follows.
Major: light brown; pronotum in side view smoothly rounded, and single-lobed in dorsal-oblique view; occiput strongly concave; petiolar node high, its apex rounded.
Minor: petiolar node in side view high, and its dorsal border nearly flat in rear view.
MEASUREMENTS (mm) Holotype major: HW 1.10, HL 1.12, SL 0.74, EL 0.16, PW 0.54.
Paratype minor: HW 0.50, HL 0.60, SL 0.66, EL 0.12, PW 0.32.
COLOR Major: body and most of head light brown; appendages and anterior third of head a slightly contrasting yellowish brown.
Minor: body and most of head light brown; gena and appendages yellowish brown.
Specimens from Lima in the Museum of Comparative Zoology are somewhat darker.
RANGE Known from the type locality, and from two other series taken in Lima, Peru.
BIOLOGY Unknown.

Compare with *camptostela*

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: Souza Lima, Várzea Grande, Mato Grosso (L. A. Wood). Scale bars = 1 mm.



Pheidole cyrtostela **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *cyrtostela,* curved column, referring to the distinctive petiole.

DIAGNOSIS With *camptostela,* unique within *Pheidole* for the sharply bent petiole and depressed petiolar node, as seen from the side, in both **major** and **minor**. Distinguished from *camptostela* by the less exaggerated form of the petiolar modification, the presence of rugoreticulum on the head of the **major**, and the broader, less concave occiput of the **minor**.

MEASUREMENTS (mm) Holotype major: HW 0.90, HL 0.92, SL 0.64, EL 0.16, PW 0.46.
Paratype minor: HW 0.42, HL 0.52, SL 0.58, EL 0.12, PW 0.30.

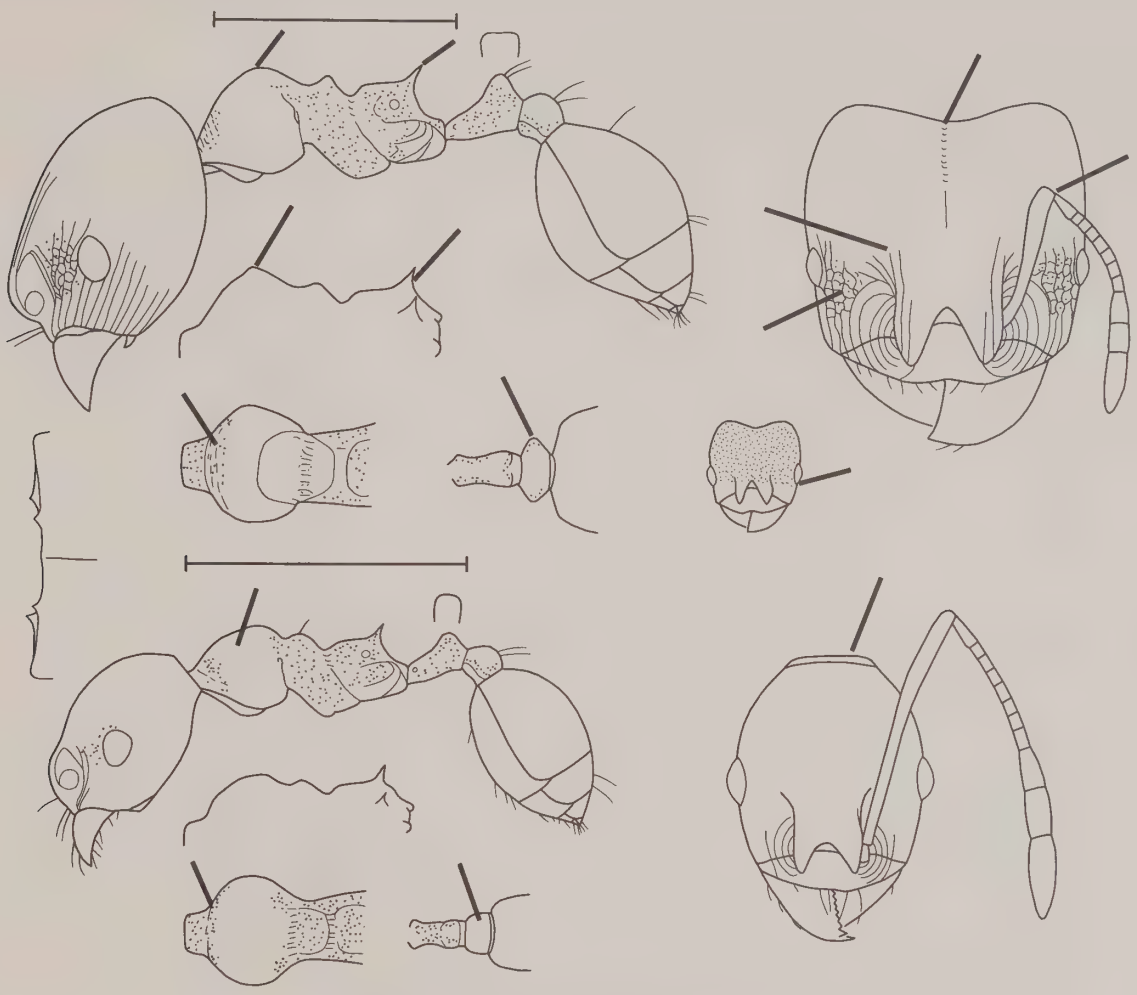
COLOR Major and minor: body and appendages medium yellow except for gaster, which is medium brown.

RANGE Known only from the type locality.

BIOLOGY The type colony was found nesting in the soil of grazed *cerrado* (tropical savanna); workers were attracted to bait.

Compare with *coffeicola, hoelldobleri, mooreorum, peregrina, zelata,* and especially *gagates*

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cocha Cashu Research Station, Madre de Dios, 400 m (Diane W. Davidson). Scale bars = 1 mm.



Pheidole davidsonae **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the collector and distinguished insect ecologist Diane W. Davidson.

DIAGNOSIS A member of the *diligens* group similar in various characters to the species listed in the heading above, and distinguished as follows.

Major: head tricolorous (see Color below); antennal scapes thick and short, their tips touching the lateral margin of the head well short of half the distance from eye to occipital corner; propodeal spine straight, about one-third as long as the basal propodeal face; pronotum peaks at middle to form subangle; rugoreticulum present between eye and antennal fossa; carinulae on head do not extend beyond eye level more than half the Eye Length; in full-face view, concavity of occipital margin very broad.

Minor: occiput narrowed, with nuchal collar; pronotum smooth except for foveolate anterior rim; postpetiole from above bell-shaped.

MEASUREMENTS (mm) Holotype major: HW 1.06, HL 1.06, SL 0.64, EL 0.20, PW 0.56.
Paratype minor: HW 0.48, HL 0.60, SL 0.70, EL 0.14, PW 0.34.

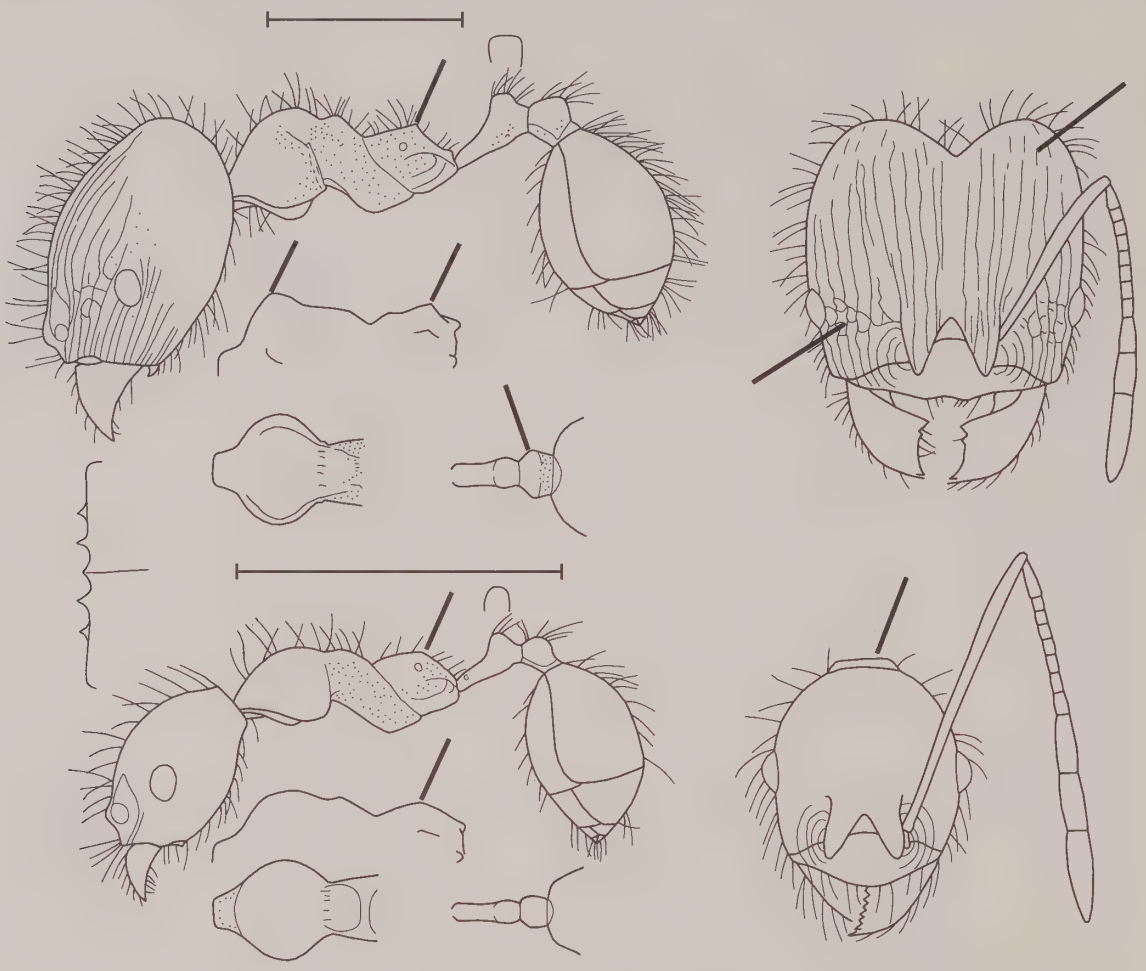
COLOR Major: head tricolorous, with clypeus yellow, head posterior to clypeus light brown, rest of head rich dark reddish brown; mesosoma and waist medium to dark reddish brown; gaster dark brown, tarsi yellow, and other appendages brownish yellow.
Minor: body medium brown; tarsi yellow; other appendages light brown.

RANGE Known only from the type locality.

BIOLOGY Unknown.

Compare with *calimana, cataractae, machetula, scimitara, sicaria, tenuis*

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios (Stefan Cover and John E. Tobin). Scale bars = 1 mm.



Pheidole demeter **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *demeter,* goddess of agriculture and social order.

DIAGNOSIS A member of the *diligens* group closest to *calimana, cataractae, scimitar,* and *tenuis,* differing as follows.

Major: humerus in side view with "sharkfin" extension; propodeal spine small and sharp or else reduced to a denticle as illustrated; posterior half of dorsal head surface covered by longitudinal carinulae, those on occiput broken and faint; space between eye and antennal fossa rugoreticulate.

Minor: propodeal spine absent; occiput narrowed, with nuchal collar.

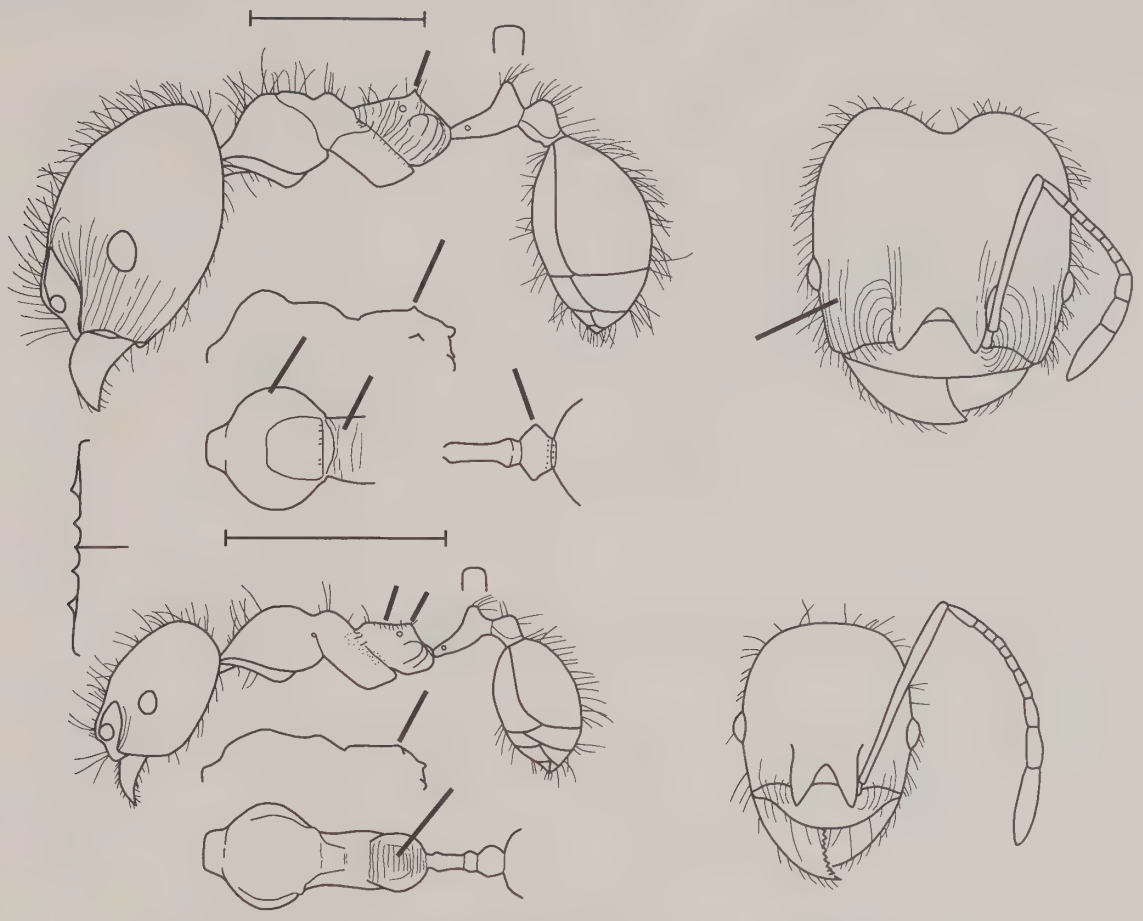
MEASUREMENTS (mm) Holotype major: HW 1.08, HL 1.12, SL 0.80, EL 0.20, PW 0.48.
Paratype minor: HW 0.52, HL 0.62, SL 0.82, EL 0.14, PW 0.32.

COLOR Major: head and mandibles light brown with slight reddish tinge; anterior half of first gastral tergite plain light brown; mesosoma and rest of gaster plain medium brown; rest of appendages light, almost yellowish brown.
Minor: concolorous plain medium brown except for first gastral tergite and appendages, which are light brown.

RANGE Known only from the type locality.

BIOLOGY Of three colonies collected by Cover and Tobin at Cuzco Amazónico, Peru, two were nesting in rotten sticks in the litter surface of terra firme forest, and the third was beneath the bark of a palm log in seasonally flooded forest.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. COSTA RICA: Las Palmas, near Bajo la Hondura, Braulio Carrillo National Park. Scale bars = 1 mm.



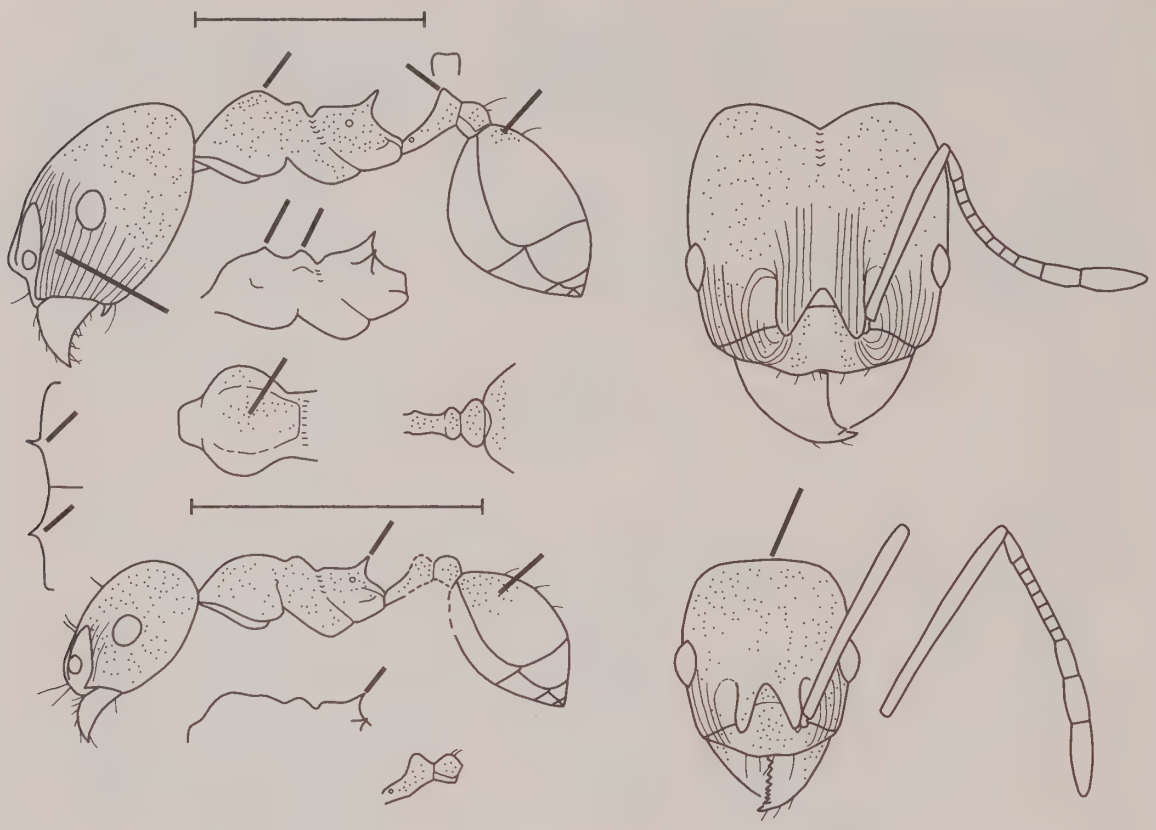
Pheidole diana Forel

Pheidole diana Forel 1908c: 51.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY No allusion given; presumably after *Diana,* the Roman goddess of nature, fertility and conception, and the Moon.
DIAGNOSIS A medium-sized member of the *diligens* group, and inhabitant of high montane forests, similar to *alfaroi, laelaps, riveti, seligmanni,* and *tepuicola,* somewhat less so to *laticornis* and *strigosa,* and distinguished from these and other *Pheidole* species by the following combination of traits.
Major: sculpturing confined to carinulae on margins of frontal lobes, anterior third of the head capsule, and entire surface of the propodeum, with the rest of the body smooth and shiny; propodeal spines reduced to denticles; postpetiole from above diamond-shaped.
Minor: sculpturing confined to circular carinulae of antennal fossae and transverse carinulae of dorsal propodeal surface, with the rest of the body smooth and shiny; propodeal spines absent; basal and declivitous faces of propodeum meet in an obtuse angle; nuchal collar absent.
MEASUREMENTS (mm) Lectotype major: HW 1.40, HL 1.44, SL 0.90, EL 0.22, PW 0.72.
Paralectotype minor: HW 0.66, HL 0.76, SL 0.72, EL 0.12, PW 0.44.
COLOR Major: appendages and most of body medium reddish yellow; gaster a slightly darker shade of plain light brown.
Minor: body concolorous plain light brown; appendages a slightly contrasting lighter shade.
RANGE Upper elevations of Cordillera Central and Cordillera de Tilaran, Costa Rica, including the Braulio Carrillo National Park, Penas Blancas Valley, and Monteverde (Longino 1997).
BIOLOGY An arboreal species that nests under epiphyte mats in the canopy of cloud forest and montane wet forest; some colonies are very large (Longino 1997).

Compare with *inversa, pugnax, radoszkowskii*

FIGURE Upper: lectotype, major (the rear view of the petiolar node is drawn from a major from Paraopeba, Minas Gerais). Lower: paralectotype, minor (the dorsal-oblique view of the mesosoma is drawn from a minor from Goiás state, and the complete antenna is drawn from a minor from "Mt. Transpantaneira," Brazil). BRAZIL: Vila Nova, "Amazonas" (Vila Nova is now in Pará state). Scale bar = 1 mm.

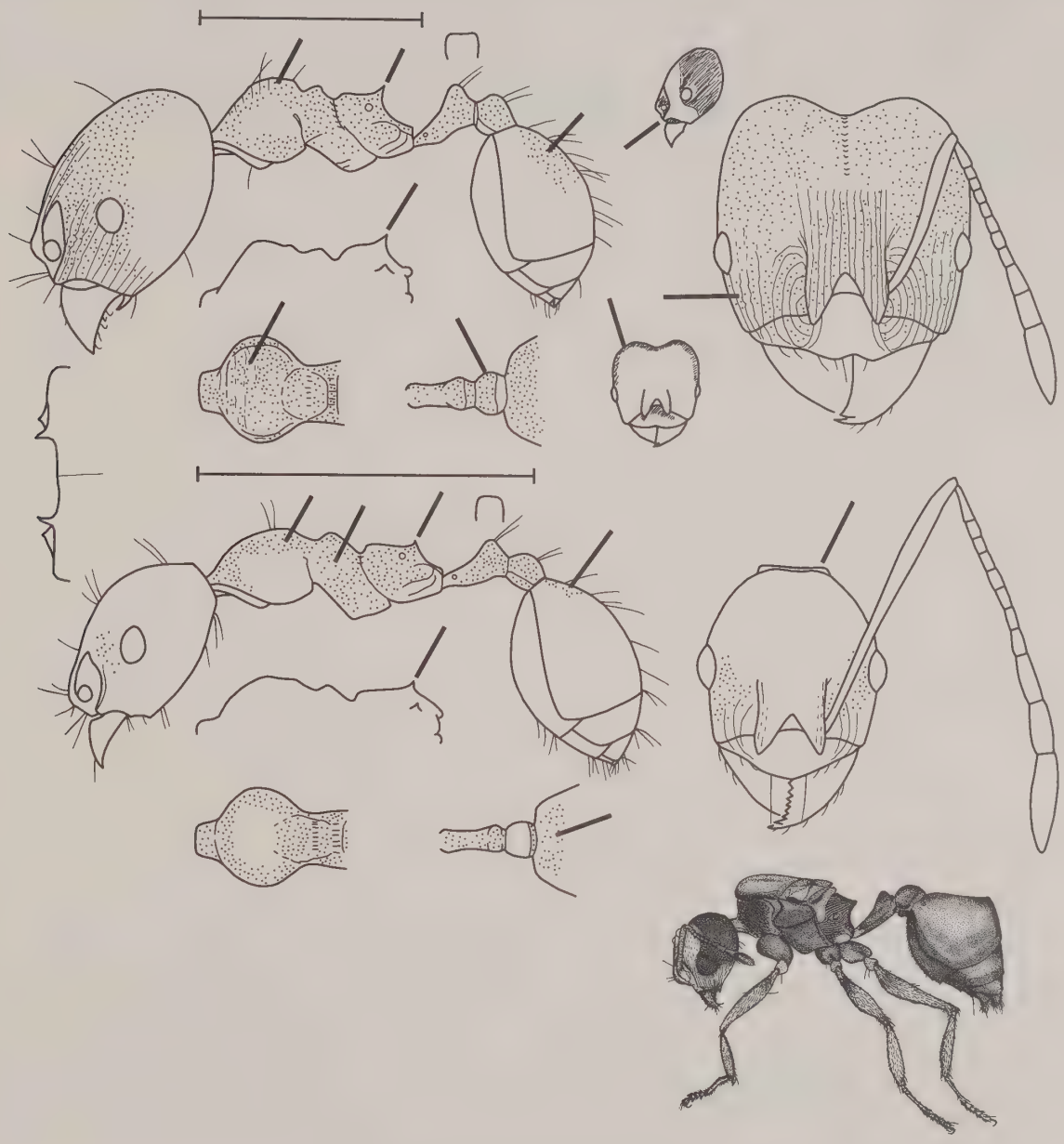


Pheidole diligens (F. Smith)

Atta diligens F. Smith 1858a: 168. Placement in *Pheidole* by Mayr 1886c: 360.

TYPES Nat. Hist. Mus. London.
ETYMOLOGY L *diligens,* industrious.
DIAGNOSIS A member of the *diligens* group distinguished from the very similar *inversa, pugnax,* and *radoszkowskii,* and other *diligens* group members by the following combination of traits.
Major: yellow; usually (or always) with two teeth on the hypostoma; sculpturing other than foveolation confined to the anterior half of the head capsule and consisting solely of carinulae (no rugoreticulation); all of head, mesosoma, and waist foveolate and opaque; only a narrow anterior strip of first gastral tergite foveolate and opaque, rest of gaster smooth and shiny; pilosity extremely sparse overall, and absent on the mesosoma; humerus cornulate in dorsal-oblique view; promesonotal profile with 2 (not 3) convexities in dorsal-oblique view.
Minor: occiput broad, lacking nuchal collar; head, mesosoma, and waist entirely foveolate and opaque; anterior half of first gastral tergite foveolate and opaque, with remainder of gaster smooth and shiny.
MEASUREMENTS (mm) Lectotype major: HW 1.06, HL 1.10, SL 0.76, EL 0.22, PW 0.52.
Paralectotype minor: HW 0.54, HL 0.64, SL 0.74, EL 0.14, PW 0.38.
COLOR Major and minor (types): concolorous medium yellow. Fresh material from Brazil is light reddish yellow.
RANGE Pará, Mato Grosso, Goiás, and São Paulo states, Brazil; and Amazonian Peru (Cuzco Amazónico, Madre de Dios).
BIOLOGY Two series were taken by Stefan Cover and John E. Tobin at Cuzco Amazónico, Peru, both in terra firme rainforest; one was in leaf litter, and another in soil beneath a small palm log. A series of the closely similar *P. radoszkowskii* was collected at the same locality, but true to the general preference of that species for disturbed habitats, the colony was in seasonally flooded forest.

FIGURE Upper: paratype, major. Lower: paratype, minor. BRAZIL: Ig. Marianil, Rio Branco Rd., 24 km northeast of Manaus. A figure of a paratype queen is also shown (from Brown 1968b). Scale bars = 1 mm.



Pheidole embolopyx Brown

Pheidole embolopyx Brown 1968b: 332.

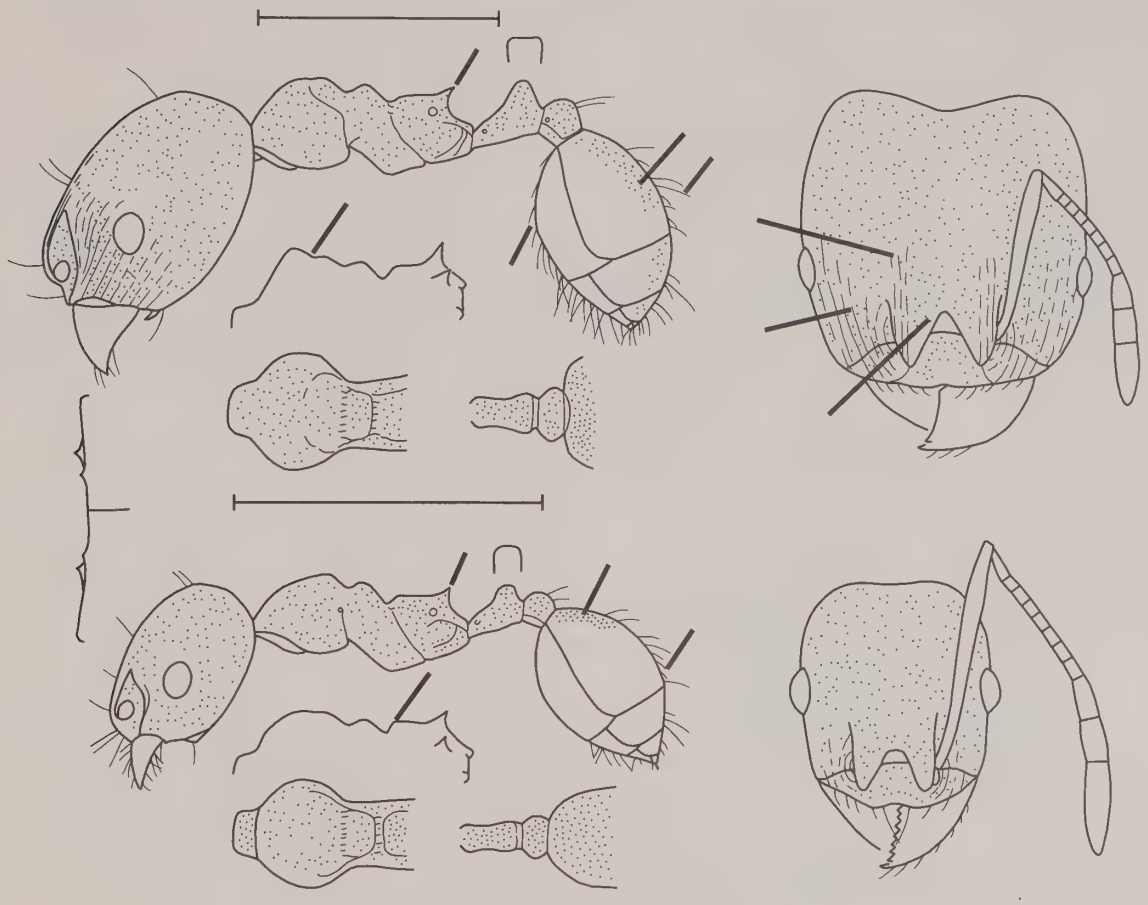
TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *embolopyx,* stopper box, referring to the truncate abdomen of the queen.
DIAGNOSIS A unique species of *Pheidole,* distinguished in the **queen** by the posteriorly flattened gastral tergites, hence truncated shape of the gaster overall, and the flattened rear surface covered by peculiar short, hooked hairs.
Major: head bicolored with broad dark yellow to light reddish brown arcs over most of the dorsal surface and on the genae and the rest medium brown, as depicted; tip of antennal scape touching head margin two-thirds from level of eye to level of occiput; most of dorsal surface of head foveolate; anterior half of pronotal dorsum transversely carinulate; anterior half of central strip of first gastral tergite shagreened; propodeal spines thick, triangular; postpetiole from above oval.
Minor: head narrowed, with nuchal collar; propodeal spines reduced; margins of pronotal dorsum foveolate; anterior fourth of central strip of first gastral tergite shagreened.
MEASUREMENTS (mm) Paratype major: HW 0.94, HL 1.00, SL 0.74, EL 0.14, PW 0.44.
Paratype minor: HW 0.44, HL 0.56, SL 0.72, EL 0.12, PW 0.32.
COLOR Major: head bicolored, as described in Diagnosis above; body light to dark yellow; appendages light brown to brownish yellow. Minor: concolorous light brown, appendages dark yellow.

RANGE In addition to two localities around Manaus, *embolopyx* has been recorded from Diamantino, Mato Grosso; from near Puerto Maldonado, Madre de Dios, Peru; and Yasuni National Park in Ecuador.

BIOLOGY *P. embolopyx* inhabits rainforest, nesting in pieces of rotting wood buried in litter. Mature colonies contain up to several hundred workers and a single nest queen. Winged queens have been found in March near Manaus. The queens do not use their truncated abdomens to block galleries and nest entrances, as expected (Wilson and Hölldobler 1985). Instead, it is likely that they assume a turtle-like crouching position when threatened, bringing into play the truncated abdomen, flanges on the pronotum, and gelatinous secretions on the front of the head. Wilson and Hölldobler also report the origin of an odor-trail pheromone in the poison gland and an alarm pheromone in the pygidial gland.

Compare with *diligens, inversa, medialis, pugnax, radoszkowskii*

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: Cuiabá, Mato Grosso (James C. Trager). Scale bars = 1 mm.



Pheidole fowleri **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the prominent Brazilian myrmecologist H. G. Fowler.

DIAGNOSIS A member of the *diligens* group distinguished as follows.

Major and **minor**: yellow; propodeal spines directed backward in side view, forming a 135-degree angle with the basal propodeal face; entire head, mesosoma, and waist foveolate and opaque.

Major: carinulae on head do not reach beyond level of eye, and are absent on the mesal half of the frontal lobes; hairs on entire profile of first gastral sternite short and subappressed; almost all of central strip of gastral tergites shagreened.

Minor: all of head, mesosoma, and waist foveolate and opaque; anterior half of central strip of first gastral tergite shagreened; in dorsal-oblique view, anterior face of propodeal dorsum drops precipitously to metanotum.

MEASUREMENTS (mm) Holotype major: HW 1.00, HL 1.04, SL 0.66, EL 0.18, PW 0.52.
Paratype minor: HW 0.50, HL 0.54, SL 0.60, EL 0.14, PW 0.34.

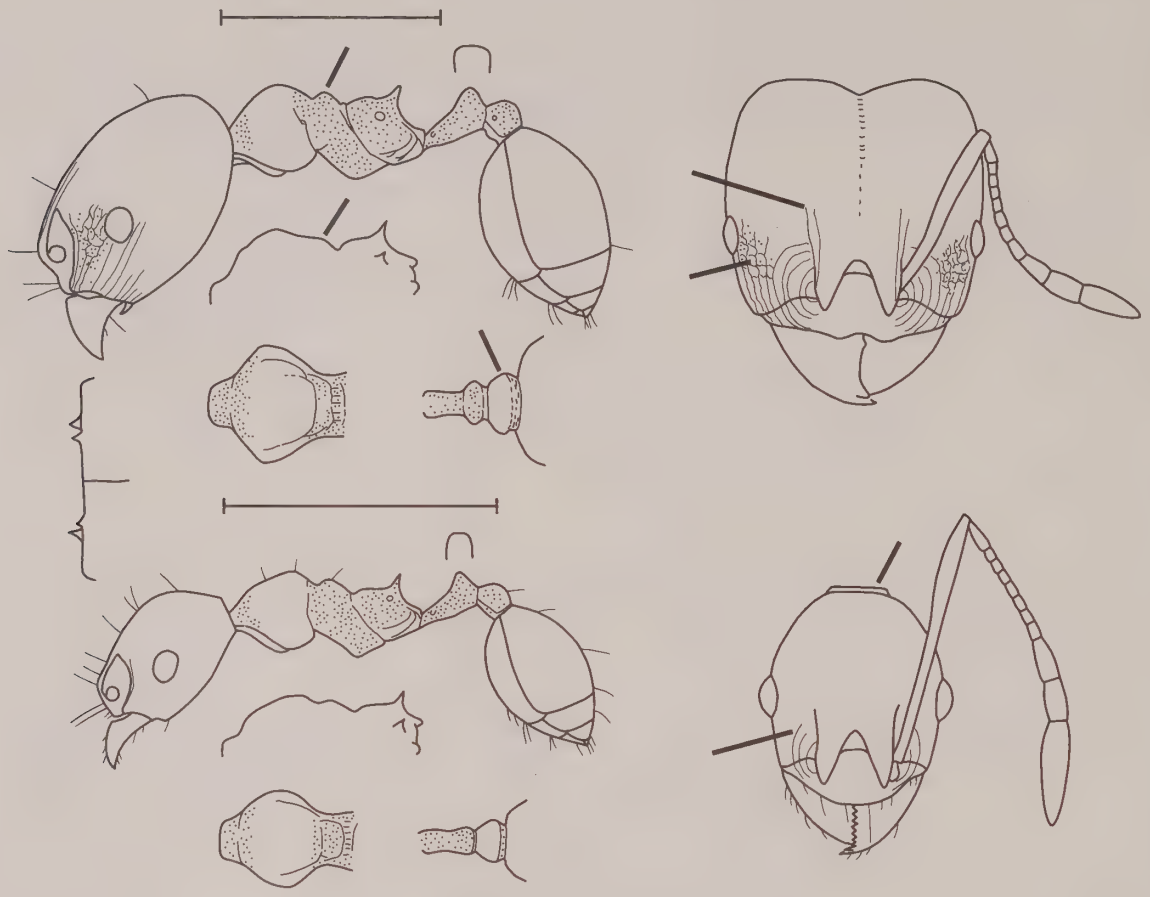
COLOR Major: concolorous reddish yellow.
Minor: concolorous plain dark yellow.

RANGE Known only from type locality in Mato Grosso; and from Goiania and Morrinhos Junction, Goiás.

BIOLOGY Collected in savanna *(cerrado)* at Morrinhos Junction and rocky forest near Goiania (W. L. Brown).

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios (Stefan Cover and John E. Tobin). Scale bars = 1 mm.



Pheidole gagates **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *gagates,* jet (black), referring to the color of the workers.

DIAGNOSIS Distinguished within the *diligens* group by the following set of traits.

Major: body concolorous blackish brown; pilosity extremely sparse, and completely absent from the mesosoma and waist; mesosomal convexity low, especially in dorsal-oblique view; postpetiolar node bell-shaped; patches of rugoreticulum present just mesad to the eyes; carinulae limited to lateral margins of the frontal lobes and sides of head anterior to the posterior margins of the eyes.

Minor: body concolorous blackish brown; occiput narrow, with nuchal collar; sculpturing very sparse, limited to circular carinae around the antennal fossae and patches of foveolation as illustrated.

See also *anima, diligens, mooreorum, nubila, piceonigra, radoszkowskii, stigma, triconstricta, venatrix,* and *zelata*.

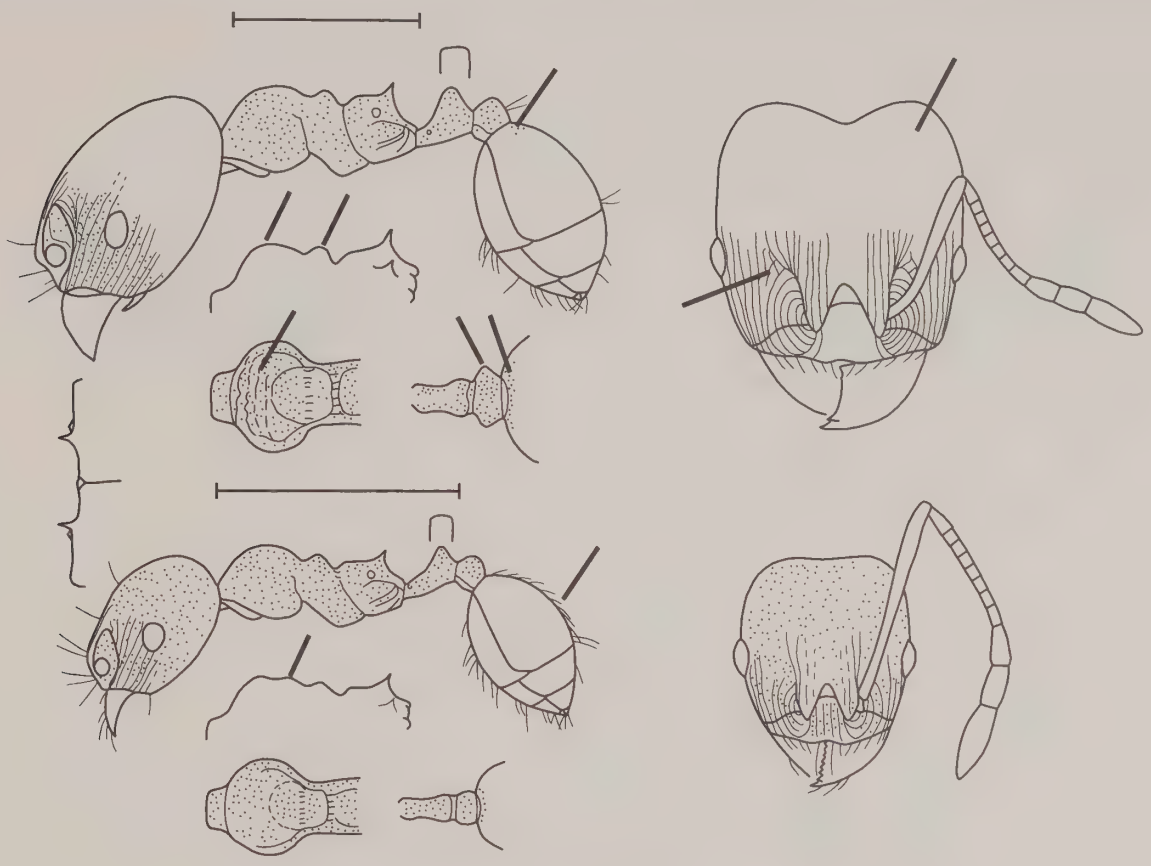
MEASUREMENTS (mm) Holotype major: HW 0.92, HL 0.96, SL 0.62, EL 0.16, PW 0.50.
Paratype minor: HW 0.46, HL 0.56, SL 0.68, EL 0.12, PW 0.32.

COLOR See description above in Diagnosis.

RANGE Known from the type locality and from Yasuni National Park, Puerto Tipugini, Ecuador.

BIOLOGY At Cuzco Amazónico, Peru, Cover and Tobin found colonies nesting in small rotten tree branches lying in leaf litter on the floor of rainforest.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Minas Gerais. Scale bars = 1 mm.



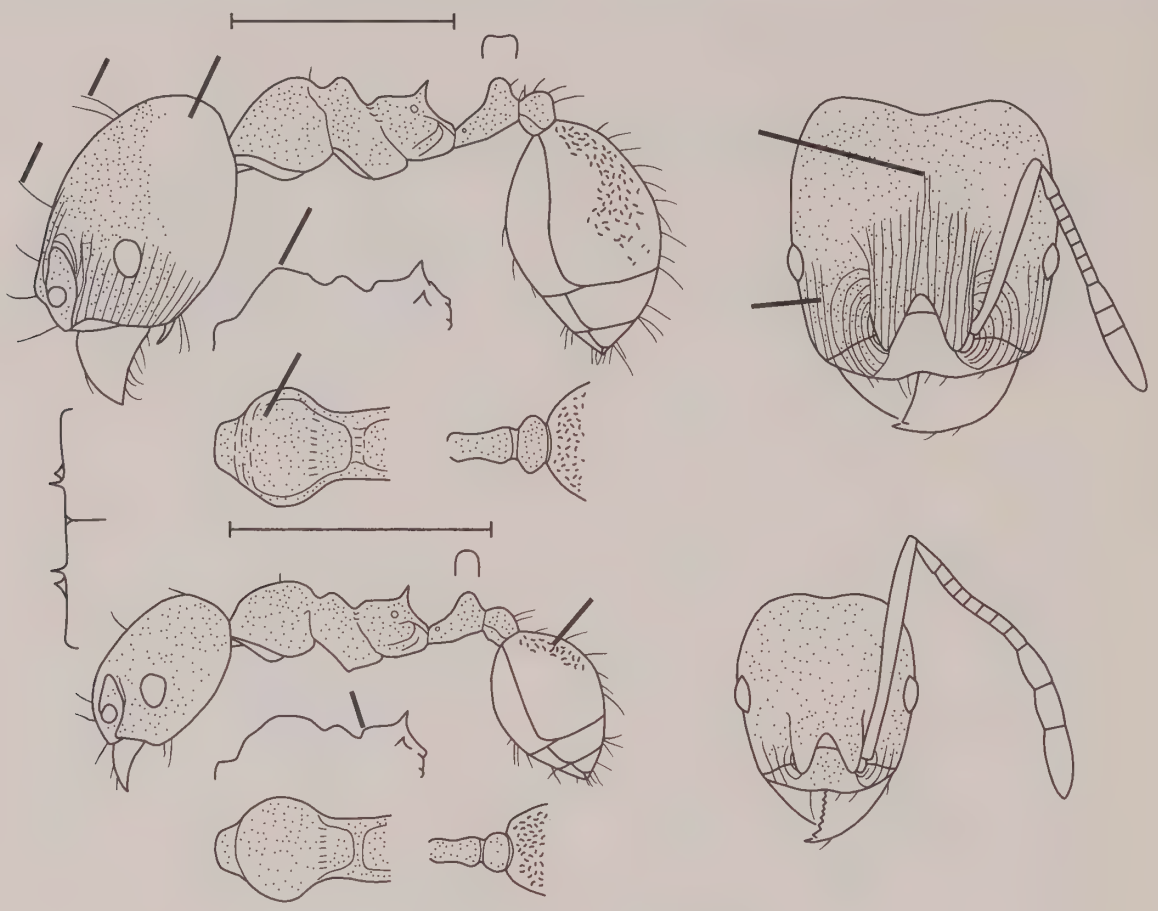
Pheidole geraesensis Santschi, **new status**

Pheidole semilaevis var. *geraesensis* Santschi 1929d: 287.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY Named after the type locality.
DIAGNOSIS A member of the *diligens* group similar to *bruesi, stigma,* and *triconstricta* (see also less similar species listed under these names, if in doubt).
Major: head bicolorous (see Color below); dorsum of head posterior to eye level smooth and shiny; a very small patch of rugoreticulum present posterior to each antennal fossa; pronotal dorsum with broken transverse rugulae, a thin anterior fringe of first gastral tergite shagreened; head posterior to eye and all of mesosoma devoid of pilosity; pronotum in dorsal-oblique view a single semicircular convexity; lateral margins of petiole subangulate.
Minor: pronotum in dorsal-oblique view bilobous; most of head and all of mesosoma and waist devoid of pilosity; dorsal margin of first gastral tergite lined exclusively with short, appressed hairs.
MEASUREMENTS (mm) Lectotype major: HW 1.18, HL 1.72, SL 0.78, EL 0.20, PW 0.60.
Paralectotype minor: HW 0.60, HL 0.64, SL 0.72, EL 0.12, PW 0.40.
COLOR Major: head bicolorous, with posterior three-fourths reddish brown and anterior fourth plus mandibles reddish yellow; body plain light brown; appendages dark yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *diligens, fowleri, medialis, pugnax, radoszkowskii*

FIGURE Upper: holotype, major. Lower: paratype, minor. PANAMA: Barro Colorado Island (Diana E. Wheeler). Scale bars = 1 mm.



Pheidole hierax **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *hierax,* hawk.

DIAGNOSIS Close to *pugnax,* and also somewhat less similar to the species listed in the heading, distinguished as follows.

Major: dark yellow; rugoreticulum absent on head; all of posterior dorsal surface of head foveolate and opaque, but posterior lateral surface smooth and shiny; carinulae along midline of head extends halfway between eye level and occiput; transverse carinulae present on anterior edge of pronotal dorsum; all of mesosoma and waist foveolate; all of central strip of first gastral tergite shagreened; pronotal dorsum in dorsal-oblique view subangulate, not bilobous; a few long, sparse hairs present on dorsal surface of head, but mesosoma almost completely bare; propodeal spiracle elliptical.

Minor: head, mesosoma, and waist completely foveolate and almost bare of pilosity; anterior half of first gastral tergite shagreened; anterior propodeal face drops precipitously to metanotum in dorsal-oblique view.

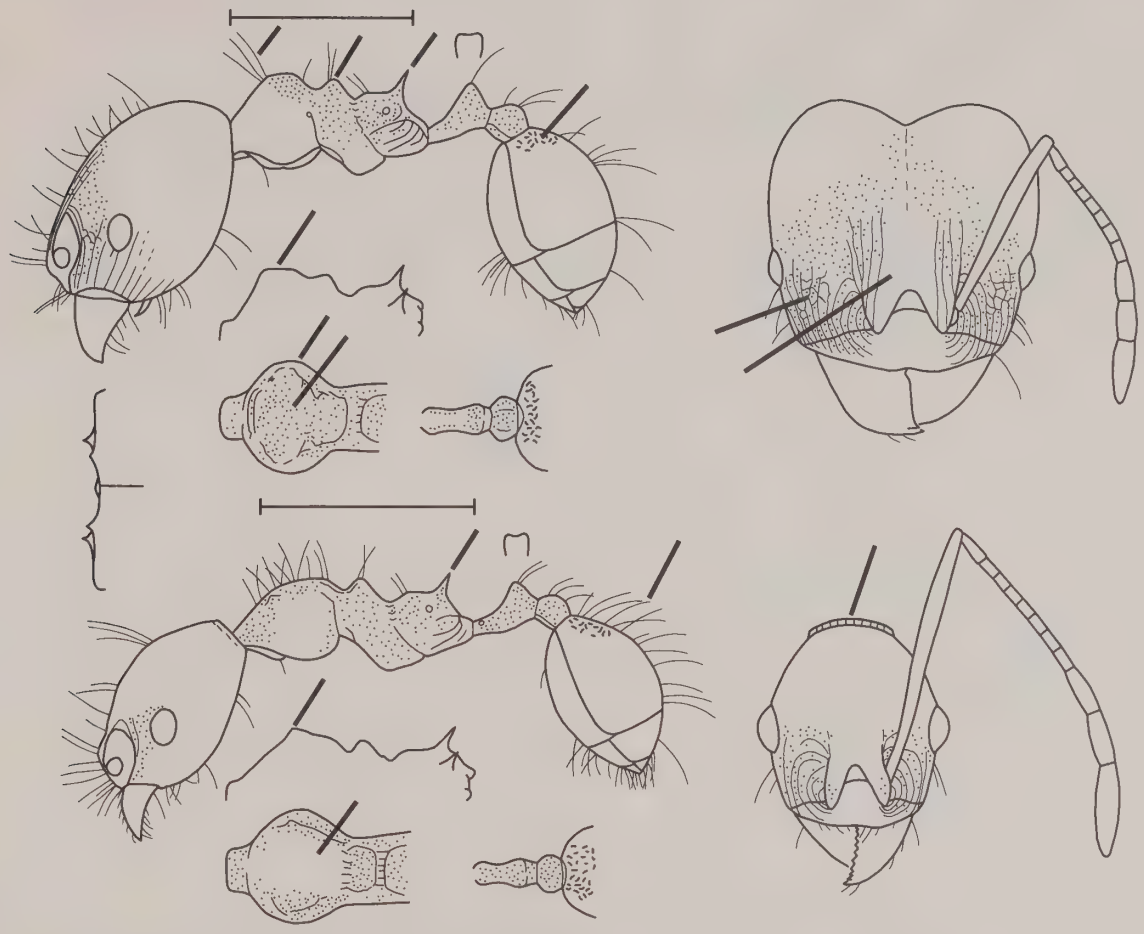
MEASUREMENTS (mm) Holotype major: HW 1.04, HL 1.04, SL 0.68, EL 0.18, PW 0.58.
Paratype minor: HW 0.54, HL 0.60, SL 0.68, EL 0.12, PW 0.38.

COLOR Major and minor: dark yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Rio Peñas, Alajuela, 950 m (J. T. Longino). Scale bars = 1 mm.



Pheidole hoelldobleri **new species**

TYPES INBio.

ETYMOLOGY Named in honor of the distinguished biologist and student of Costa Rican ants Bert Hölldobler.

DIAGNOSIS A bicolorous member of the *diligens* group whose majors have angulate humeri; thin propodeal spines; long, sparse pilosity; rugoreticulum mesad to the eyes; and shagreened anterior fourth of the first gastral tergite.

Close to *coffeicola,* but differing in color and many details of sculpturing as shown.

Also scan somewhat less similar *aculifera* (in the *fallax* group), *mooreorum, perdiligens, pubiventris, sicaria, spilota, variegata, venatrix,* and *zelata*.

MEASUREMENTS (mm) Holotype major: HW 1.24, HL 1.24, SL 0.94, EL 0.20, PW 0.56.

Paratype minor: HW 0.70, HL 0.86, SL 1.06, EL 0.14, PW 0.44.

COLOR Major: bicolorous, with gaster dark, almost blackish brown and rest of body and appendages dark reddish yellow.

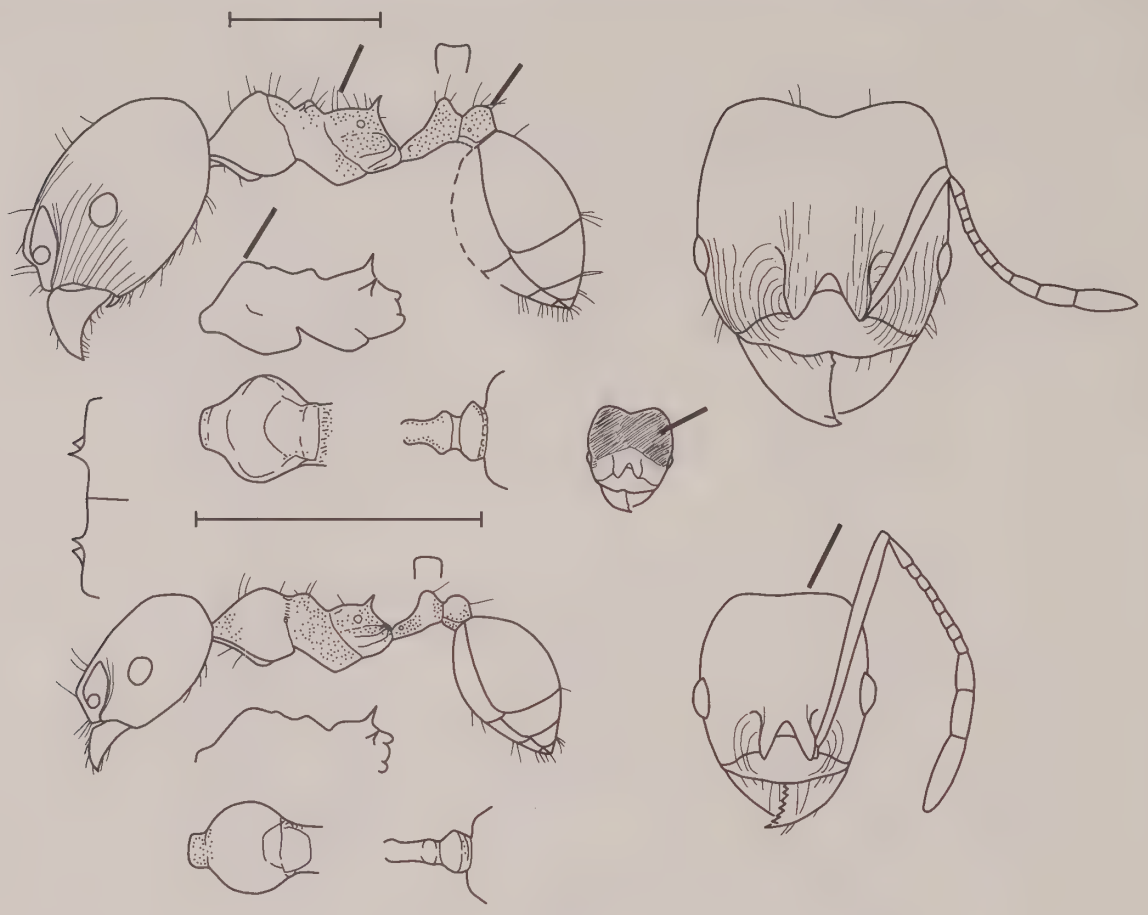
Minor: bicolorous, with gaster medium brown, rest of body and appendages dark brownish yellow.

RANGE Atlantic and Pacific slopes of Costa Rica (Longino 1997).

BIOLOGY Longino (1997) states that *hoelldobleri* "occurs in wet forest habitats, either in the canopy of mature forest or in small trees of young second growth, where it nests opportunistically in cavities in live stems, and in the forks of small trees. It may use accretal soil as nest material." He obtained specimens by fogging in the canopy of the forest of the La Selva Biological Station, as well as from guava (*Psidium*) and *Cecropia* trees along roads and in pastures.

Compare with *anima, perdiligens, piceonigra, tschinkeli*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. COSTA RICA: "Tonduz." Scale bars = 1 mm.



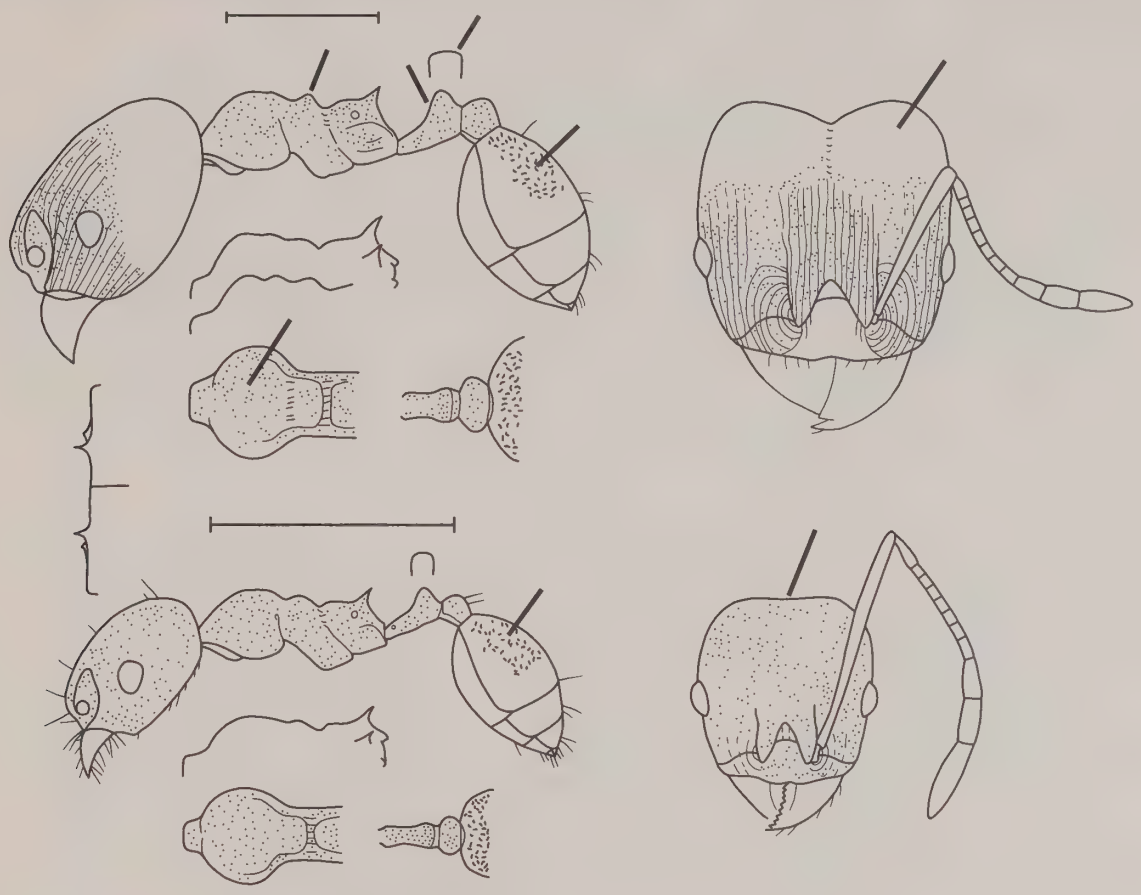
Pheidole indistincta Forel

Pheidole indistincta Forel 1899e: 75.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY L *indistincta,* obscure, allusion unknown.
DIAGNOSIS Close to *piceonigra* of Costa Rica and Mexico, considered by Longino (1997) to belong with it in a single, very variable species, but by me to represent a different, sympatric species. See description of the differences in the Diagnosis of *piceonigra*.
MEASUREMENTS (mm) Lectotype major: HW 1.26, HL 1.20, SL 0.94, EL 0.22, PW 0.66.
Paralectotype minor: HW 0.60, HL 0.62, SL 0.64, EL 0.14, PW 0.40.
COLOR Major: body and posterior two-thirds of head plain medium brown; anterior third of head a slightly contrasting yellowish brown; appendages yellowish brown.
Minor: concolorous plain light brown; appendages tending to yellowish brown, especially tarsi.
RANGE Known only from Costa Rica; see discussion under *piceonigra*.
BIOLOGY Unknown; see discussion under *piceonigra*.

Compare with *bruesi, diligens, laidlowi, radoszkowskii, triconstricta*

FIGURE Upper: lectotype, major (upper mesosomal profile, lectotype; lower mesosomal profile, major from Curaçao). Lower: paralectotype, minor. COLOMBIA: Barranquilla. Scale bars = 1 mm.



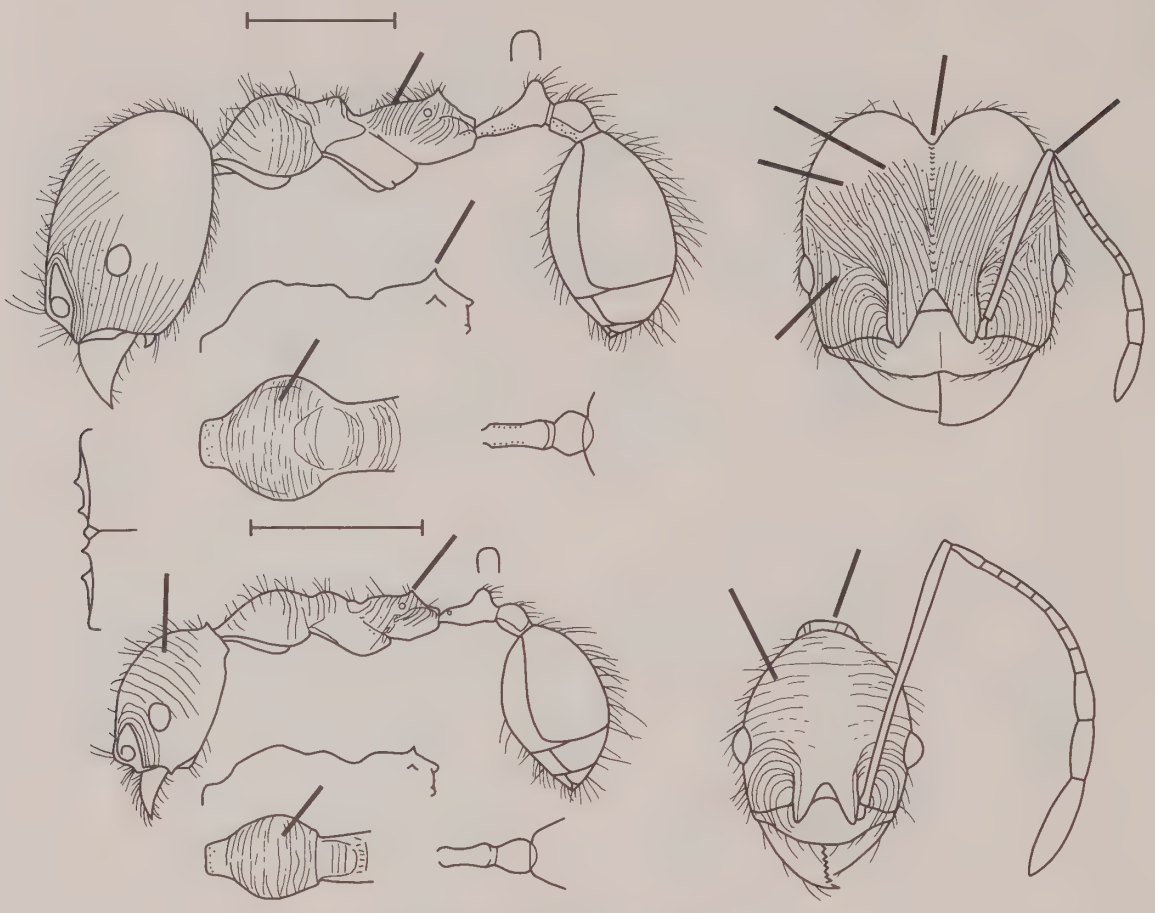
Pheidole inversa Forel, **new status**

Pheidole radoszkowskii var. *inversa* Forel 1901j: 363.

TYPES Lectotype and paralectotype: Nat. Mus. Nat. Hist. U.S. Paralectotypes: Mus. Hist. Nat. Genève.
ETYMOLOGY L *inversa,* turned upside down, allusion unknown.
DIAGNOSIS A small reddish brown, nearly hairless member of the *diligens* group, close to *bruesi* of Grenada, *diligens* and *laidlowi* of Brazil, and the widespread and very abundant Neotropical *radoszkowskii* and *triconstricta*.
P. inversa is distinguished from all these species by the following combination of traits.
Major: anterior two-thirds of head longitudinally carinulate, posterior one-third smooth and shiny; cephalic rugoreticulum absent; petiolar node relatively thick in side view; anterior three-fourths of median strip of first gastral tergite shagreened and opaque.
Minor: posterior two-thirds of median strip of first gastral tergite shagreened and opaque.
This form and *bruesi,* as well as *diligens,* may prove to fall within the substantial variation of *radoszkowskii* and thus become synonymous.
MEASUREMENTS (mm) Lectotype major: HW 1.02, HL 1.08, SL 0.80, EL 0.20, PW 0.50.
Paralectotype minor: HW 0.56, HL 0.64, SL 0.76, EL 0.16, PW 0.38.
COLOR Major: body light reddish brown; appendages brownish yellow.
Minor: concolorous light reddish brown.
RANGE Northern lowland Colombia and Curaçao.
BIOLOGY Unknown.

Compare with *alfaroi, diana, riveti, seligmanni, tepuicola*

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Pance, Mun. de Cali, Valle, 1700 m (W. L. Brown and S. Chaplin). Scale bars = 1 mm.



Pheidole laelaps **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *laelaps,* a storm.

DIAGNOSIS Similar in various ways to the species listed in the heading, but easily distinguished by the following combination of traits.

Major: most of the dorsal surface of the head carinulate, with carinulae originating on the frontal lobes and carinae along the midline spread outward (laterad), those laterad to the frontal carinae approach the lateral margins of the head seen in full face; occipital cleft very deep; antennal scapes fall short of the occipital corner by 2× their own maximum width; propodeal spines equilaterally triangular.

Minor: entire dorsal surface of head and mesosoma transversely carinulate; nuchal collar broad and well demarcated; propodeal spines reduced to denticles.

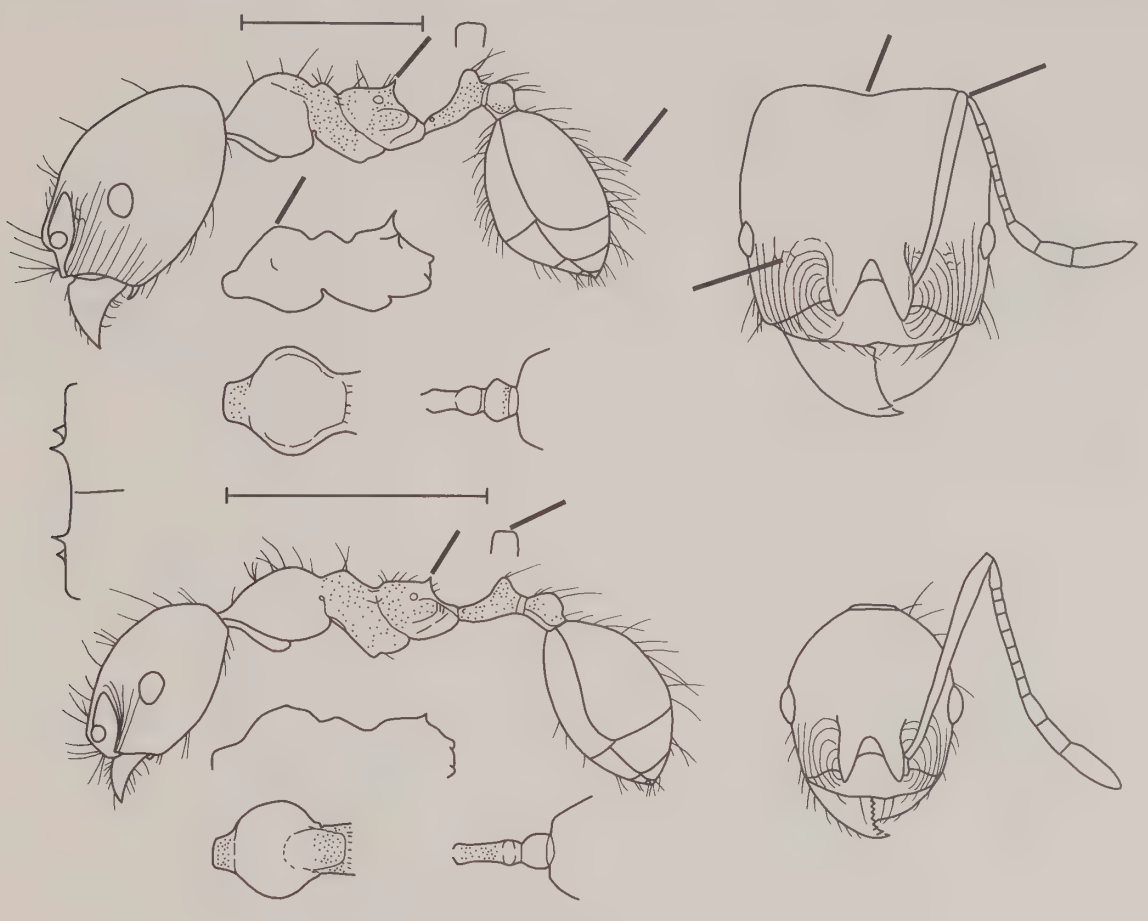
MEASUREMENTS (mm) Holotype major: HW 1.66, HL 1.74, SL 1.24, EL 0.22, PW 0.76.
Paratype minor: HW 0.70, HL 0.90, SL 1.18, EL 0.14, PW 0.48.

COLOR Major and minor: concolorous yellow.

RANGE Known from the type locality (Pance, Colombia) and from near Cochancay on the Guayaquil-El Tambo Highway, Cañar, Ecuador.

BIOLOGY The type series was collected in montane rainforest.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Santa Catarina. Scale bars = 1 mm.

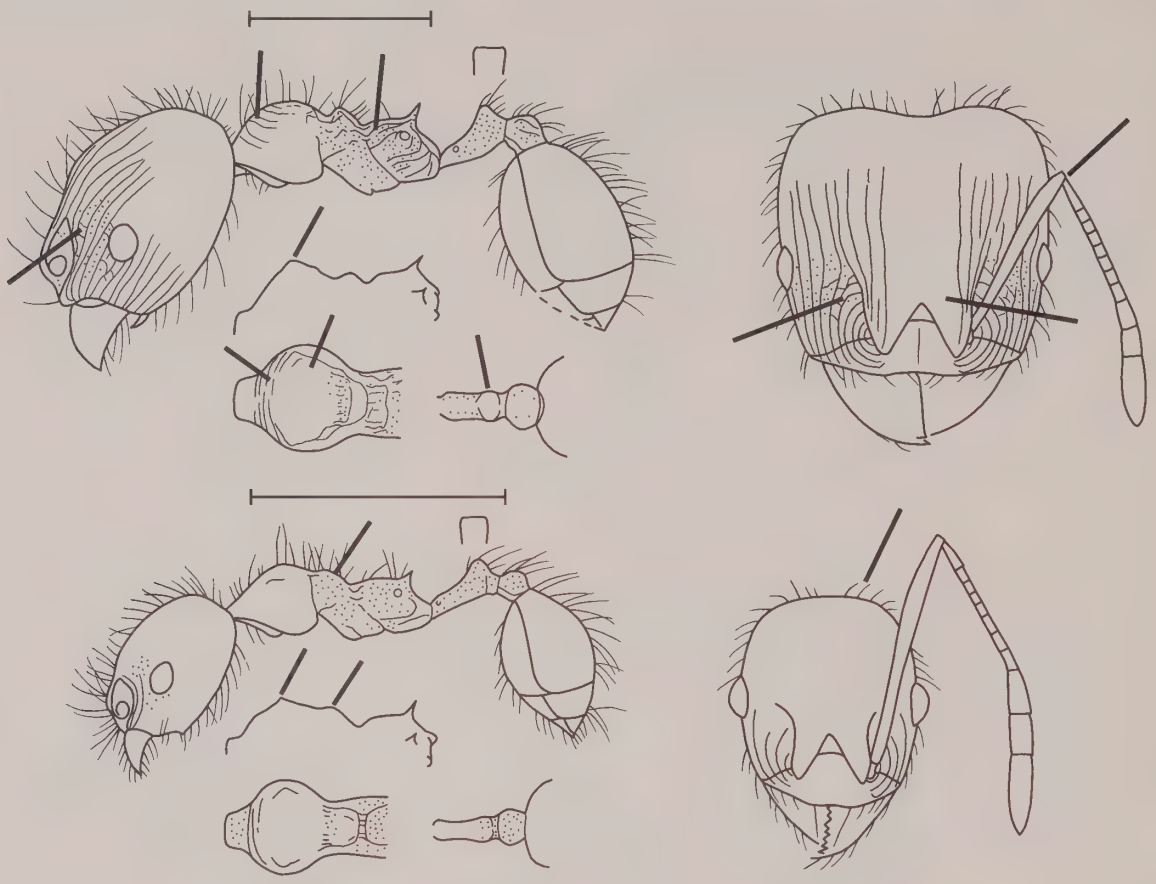


Pheidole laevifrons Mayr

Pheidole laevifrons Mayr 1887: 598.

TYPES Naturhist. Mus. Wien.
ETYMOLOGY L *laevifrons,* smooth or polished front, presumably alluding to the mostly smooth, shiny dorsum of the head of both castes.
DIAGNOSIS A small, yellow member of the *diligens* group, distinguished as follows.
Major: cephalic sculpturing limited to the anterior third of the head, level with and anterior to the eyes; moderately abundant pilosity; relatively short propodeal spines. Close to *peregrina,* but major with much shallower occipital cleft in frontal view, thinner petiolar peduncle and node in side view, and more mesad placement of cephalic rugoreticulum.
Minor: thicker propodeal spines and longer scapes. Also similar to *triconstricta* but with much denser pilosity, shallower occipital cleft, and bilobous as opposed to trilobous promesonotal profile in dorsal-oblique view.
See also the less similar *coffeicola, pubiventris, seeldrayersi,* and *variegata*.
MEASUREMENTS (mm) Lectotype major: HW 1.08, HL 1.06, SL 0.86, EL 0.20, PW 0.54.
Paralectotype minor: HW 0.60, HL 0.70, SL 0.82, EL 0.14, PW 0.36.
COLOR Major and minor: concolorous yellow.
RANGE Known only from the type series.
BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: São Paulo, S. P. Scale bars = 1 mm.

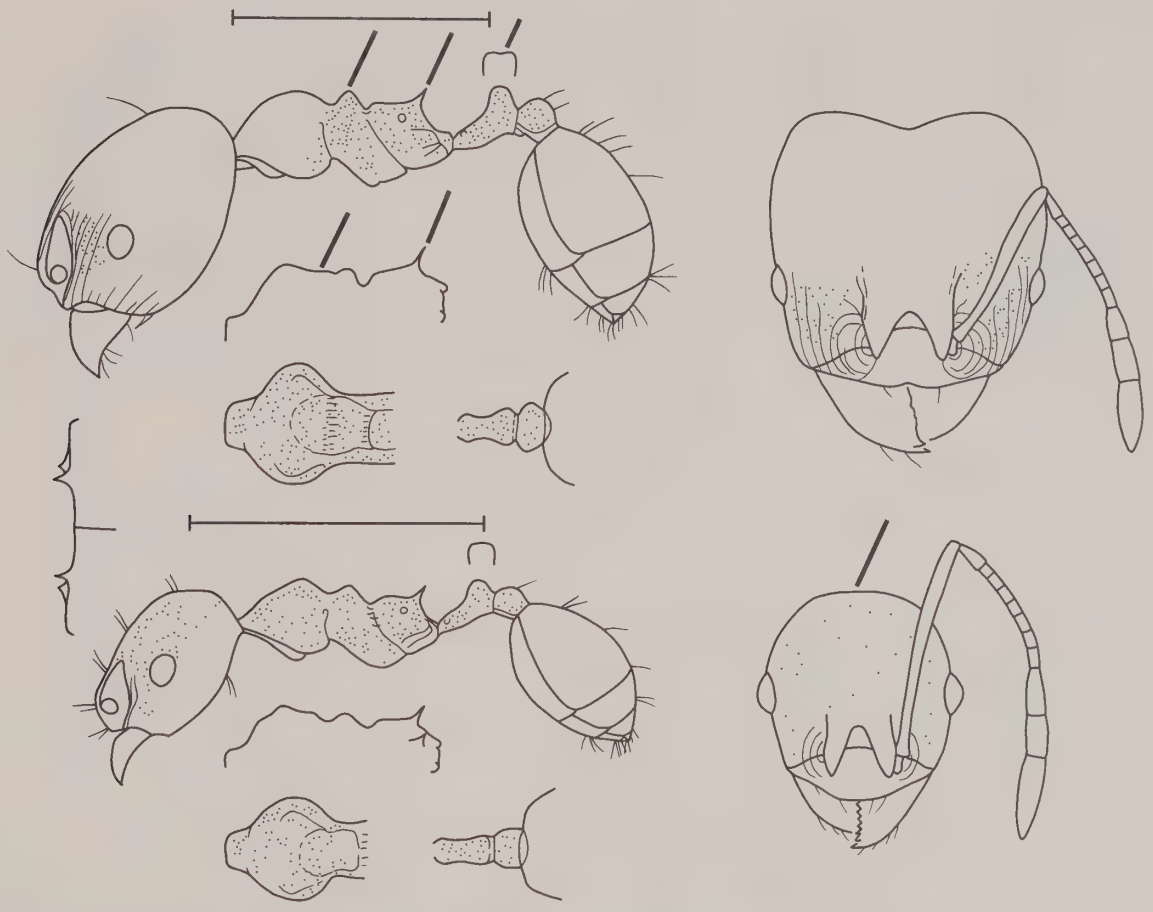


Pheidole laevinota Forel, **new status**

Pheidole rufipilis var. *laevinota* Forel 1908h: 371.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY L *laevinota,* smooth notum, evidently in contrast to that of *rufipilis*.
DIAGNOSIS Similar to species listed in heading, but especially to *rufipilis,* a partially sympatric species from which it differs as follows.
Major: rugoreticulum present posterior-laterad to antennal fossa; front and lateral margins of pronotum carinulate, but pronotal center smooth and shiny; upper side of propodeum carinulate; postpetiolar node from above oval; humerus in dorsal-oblique view subangulate.
Minor: humerus in dorsal-oblique view angulate; pronotal dorsum smooth.
MEASUREMENTS (mm) Holotype major: HW 1.18, HL 1.16, SL 0.86, EL 0.20, PW 0.58.
Paratype minor: HW 0.54, HL 0.64, SL 0.74, EL 0.14, PW 0.40.
COLOR Major: body light brown, appendages dark yellow.
Minor: concolorous light brown.
RANGE Recorded by Kempf (1972a) from São Paulo and Jujuy, northern Argentina. I have verified another Argentine record, from near Horco Molle, Tucumán, 750–900 m (W. L. Brown).
BIOLOGY The Horco Molle series was collected in subtropical evergreen forest, and includes a male (19–22 January).

FIGURE Upper: lectotype, major. BRAZIL: Rio Madeira (W. M. Mann). Minor: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios, Peru (Stefan Cover and John E. Tobin). Scale bars = 1 mm.

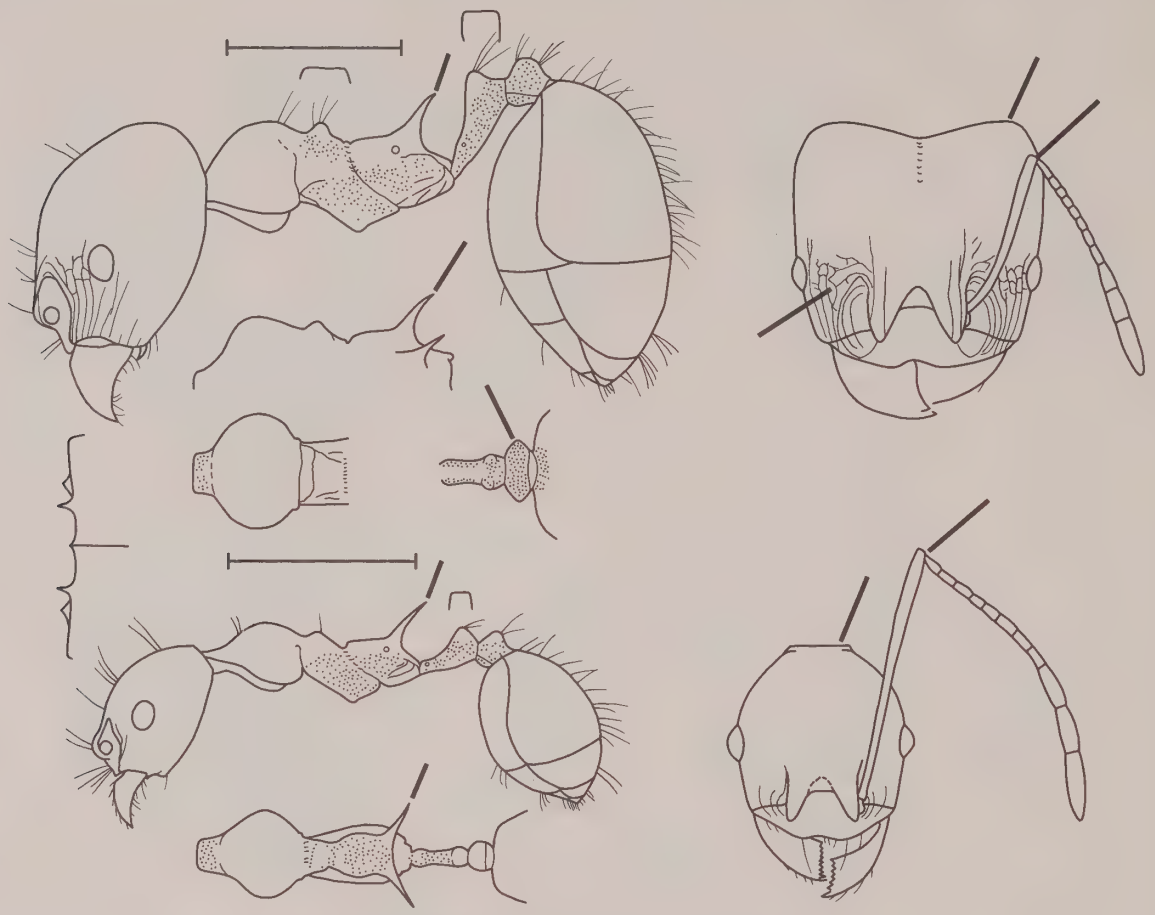


Pheidole laidlowi Mann, **new status**

Pheidole triconstricta var. *laidlowi* Mann 1916: 434.

TYPES Mus. Comp. Zoology Harvard.
ETYMOLOGY Eponymous.
DIAGNOSIS A small, yellow, nearly hairless member of the *diligens* group, similar to *bruesi, diligens, inversa, radoszkowskii,* and *triconstricta,* differing by the following combination of traits.
Major: sculpture of dorsal surface of head entirely limited to longitudinal carinula restricted to part of head anterior to the posterior eye margin, with no rugoreticulum, and the frontal lobes bare; promesonotal profile strictly 2-lobed, with the lobes connected by a shallow, saddle-like concavity in dorsal-oblique view; propodeal spine very thin, needle-like; color pale yellow.
Minor: differing from that of the species just listed by its narrow occiput.
MEASUREMENTS (mm) Lectotype major: HW 0.96, HL 0.98, SL 0.66, EL 0.14, PW 0.48.
Paralectotype minor: HW 0.48, HL 0.56, SL 0.66, EL 0.10, PW 0.34.
COLOR Major and minor: concolorous pale yellow.
RANGE Amazonian Brazil and Peru.
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: Fazenda Esteio, 90 km north of Manaus (E. O. Wilson). Scale bars = 1 mm.



Pheidole lancifer **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *lancifer,* spear carrier, referring to the propodeal spines of both castes.

DIAGNOSIS A large, blackish brown member of the *diligens* group easily distinguished by the following traits.

Major: blackish brown; large; head distinctly broader than long; antenna approaching within 25 its maximum length the occipital corner; space between eye and antennal fossa rugoreticulate; head and body mostly smooth; propodeal spine nearly as long as the basal propodeal space anterior to it.

Minor: very dark brown; propodeal spines in side view as long as the basal propodeal face anterior to them, and from above widely divergent; occiput narrowed, with nuchal collar.

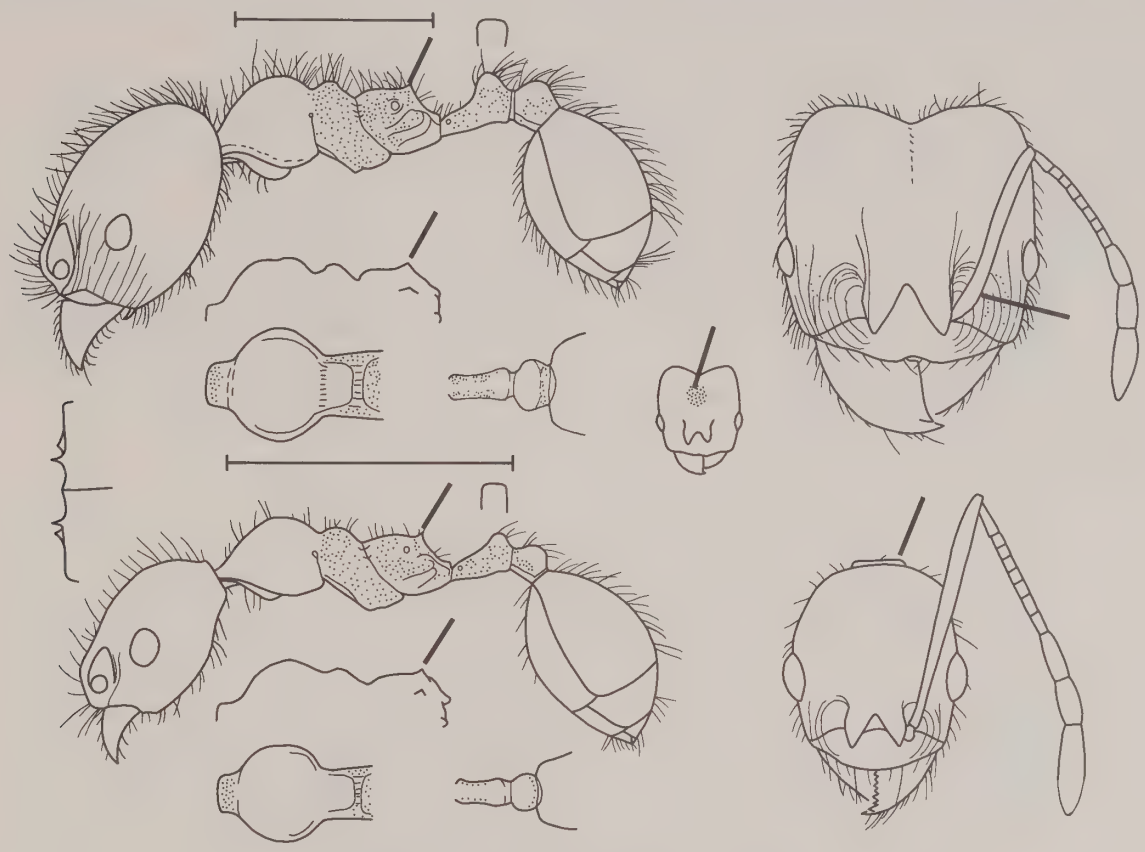
MEASUREMENTS (mm) Holotype major: HW 1.64, HL 1.56, SL 1.10, EL 0.24, PW 0.82.
Paratype minor: HW 0.72, HL 0.82, SL 1.10, EL 0.20, PW 0.48.

COLOR Major: concolorous very dark brown to black, except for tarsi and funiculi, which are light to medium brown.
Minor: body and antennal scape very dark, almost blackish brown; remainder of appendages medium brown.

RANGE In addition to the type series, from north of Manaus, I have seen specimens from Carajás, Pará, Brazil, and Cuzco Amazónico, near Puerto Maldonado, Madre de Dios (Stefan Cover and John E. Tobin).

BIOLOGY I raised the type colony from a dealate queen I captured on the floor of lowland rainforest near Manaus; the colony, after growing to contain several hundred workers, produced males. A colony found at Cuzco Amazónico by Cover and Tobin was nesting in a rotten stick in leaf litter on the floor of terra firme forest, and contained males on 12 June.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Palmar, Puntarenas (E. O. Wilson). Scale bars = 1 mm.

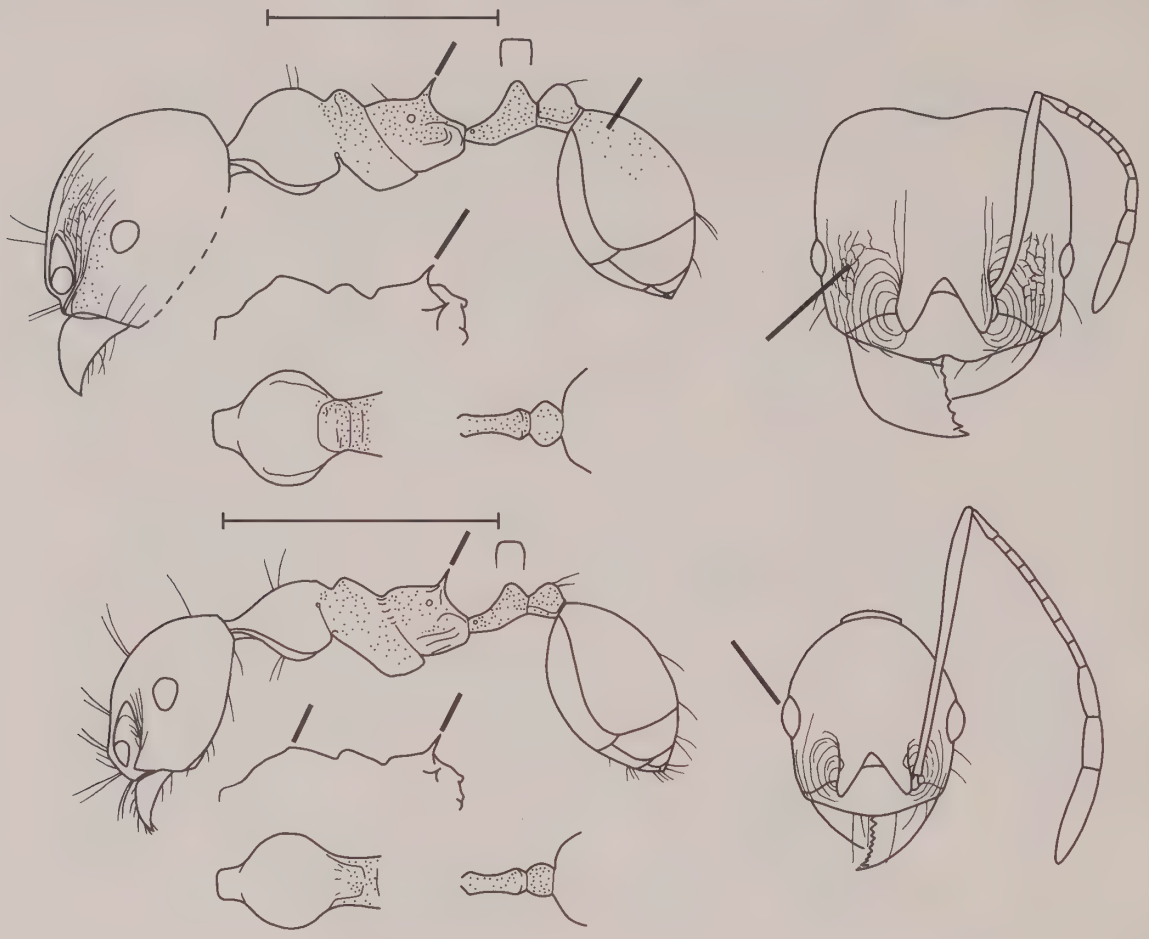


Pheidole laticornis **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *laticornis,* broad-horned, referring to the basally widened scape.
DIAGNOSIS A member of the *diligens* group close to *coffeicola* and *vafra* and differing from that species and other *diligens* group members by the following combination of traits.
Major: scape broadened at the base, wider there than near the apex; head dark yellow, with brown spot on vertex; propodeal spines reduced to denticles.
Minor: propodeal spines reduced to denticles; occiput narrowed, with nuchal collar.
Other traits as illustrated.
MEASUREMENTS (mm) Holotype major: HW 1.02, HL 1.08, SL 0.76, EL 0.18, PW 0.58.
Paratype minor: HW 0.48, HL 0.60, SL 0.76, EL 0.14, PW 0.34.
COLOR Major: body and head dark yellow, with fuzzy, circular brown spot on vertex, except for gaster, which is yellowish brown.
Minor: mesosoma, petiole, and appendages dark yellow; head, postpetiole, and gaster yellowish to plain light brown.
RANGE Known from the type locality and from Agua Caliente and Cartago, Costa Rica.
BIOLOGY Unknown.

Compare with *diligens, radoszkowskii, triconstricta*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Belém, Pará. Scale bars = 1 mm.



Pheidole lemur Forel

Pheidole lemur Forel 1912g: 225.

TYPES Mus. Hist. Nat. Genève.

ETYMOLOGY L *lemur,* ghost, shade of the departed, possibly alluding to the pale color of both castes.

DIAGNOSIS A small, yellow member of the *diligens* group whose **major** is notable for its long propodeal spines, very sparse pilosity, mostly smooth and shiny body surface (but with partially shagreened first gastral segment), and small patch of rugoreticulum mesad to each eye. Similar to *triconstricta* but with bilobous (not trilobous) promesonotal profile in dorsal-oblique view and in other details of body form and sculpture. See also *diligens* and *radoszkowskii*.

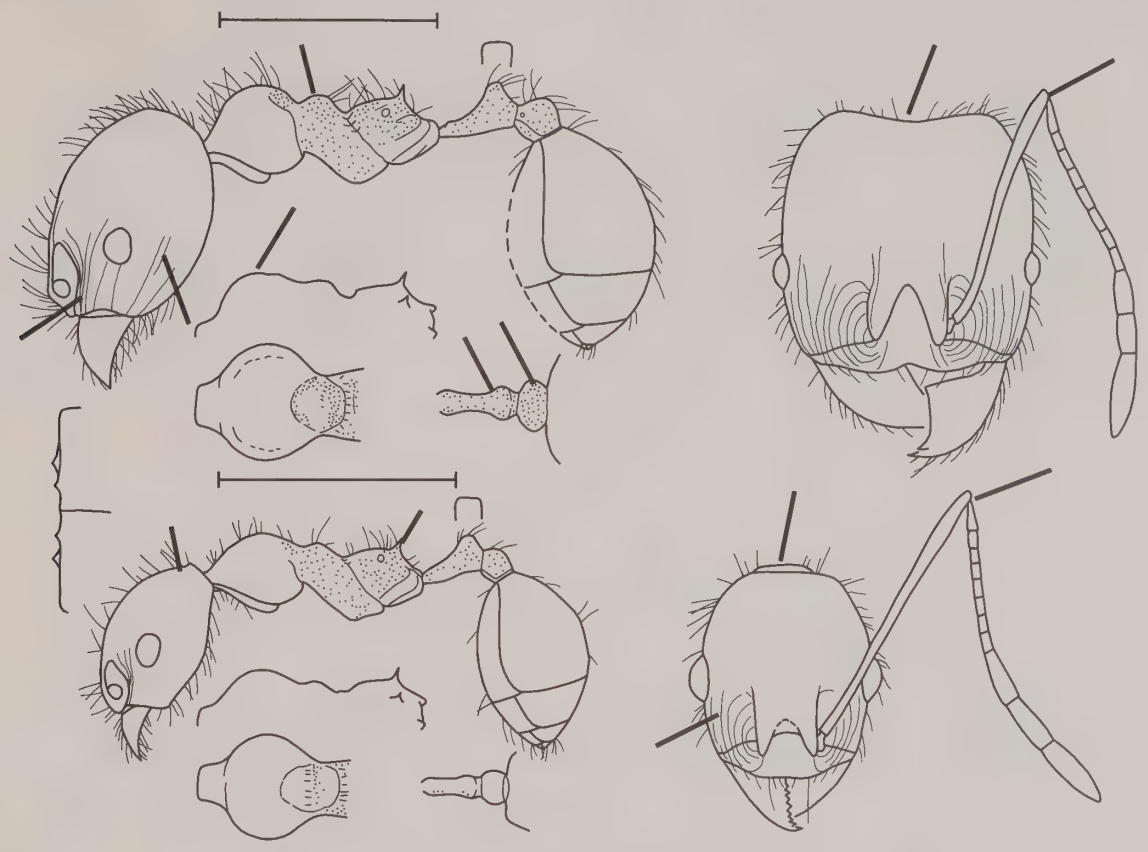
MEASUREMENTS (mm) Lectotype major: HW 0.96, HL 0.90, SL 0.80, EL 0.14, PW 0.48.
Paralectotype minor: HW 0.52, HL 0.64, SL 0.84, EL 0.12, PW 0.34.

COLOR Major: concolorous yellow, with the head and mesosoma a shade darker than the waist, gaster, and appendages.
Minor: concolorous yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. VENEZUELA: Puerto Cabello, Carabobo (Auguste Forel). Scale bars = 1 mm.



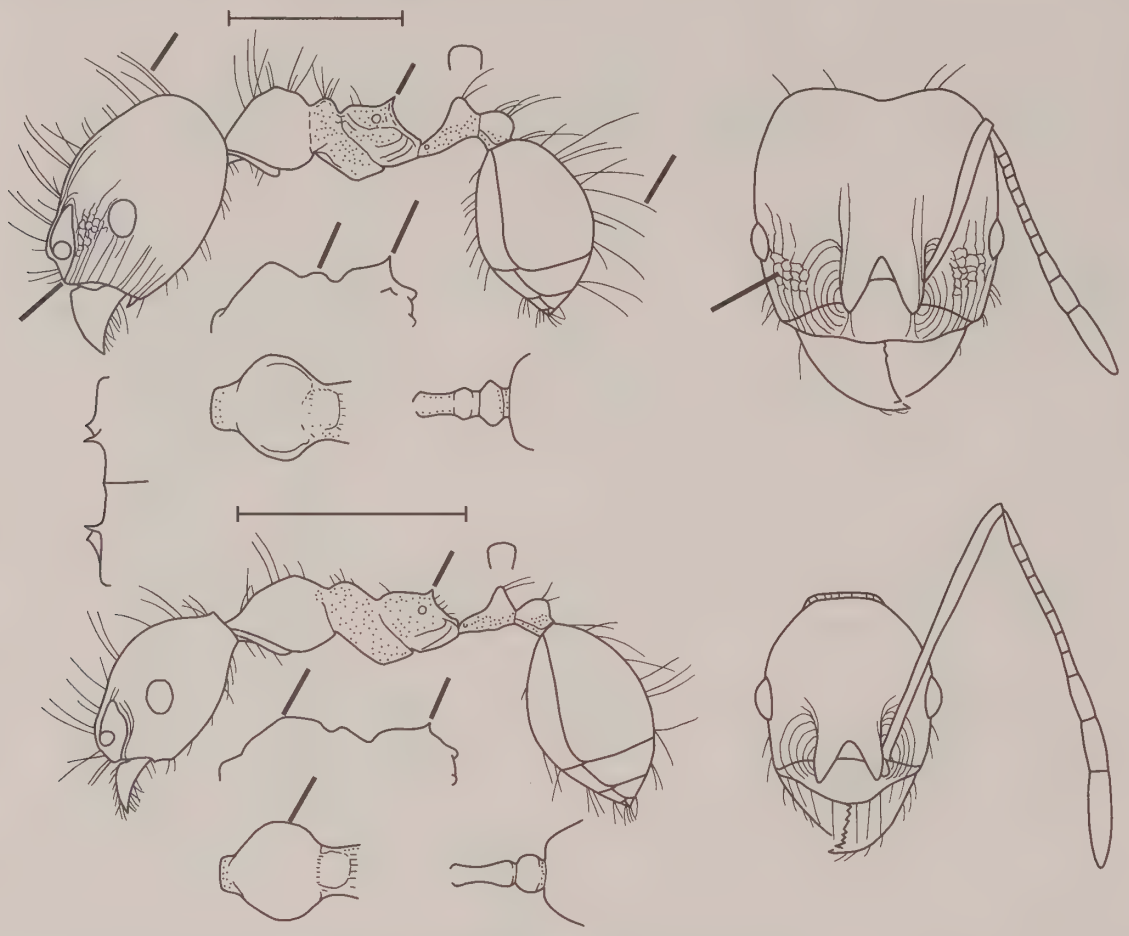
Pheidole longiscapa Forel

Pheidole longiscapa Forel 1901j: 358. Syn.: *Pheidole longiscapa* r. *martensis* Forel 1914c: 615, n.syn.; *Pheidole longiscapa* r. *martensis* var. *scabroccipitut* Forel 1914c: 615, unavailable name (quadrinomial).

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY L *longiscapa,* long-stemmed, referring to the antennal scapes.
DIAGNOSIS A member of the *diligens* group close to *rochai* and less so to *cocciphaga* and other species listed above and under the Diagnosis of *rochai,* distinguished as follows.
Major: reddish yellow; scape exceeds occipital corner by 2.5× the maximum scape width; mesonotal convexity in side view prominently and symmetrically convex; occipital cleft shallow; petiolar and postpetiolar dorsa foveolate and opaque.
Minor: propodeal spine thin, needle-like; occiput narrow, with nuchal collar.
MEASUREMENTS (mm) Lectotype major: HW 0.98, HL 1.00, SL 0.92, EL 0.18, PW 0.52.
Paralectotype minor: HW 0.48, HL 0.62, SL 0.82, EL 0.14, PW 0.34.
COLOR Major: concolorous reddish yellow.
Minor: body light yellowish brown, appendages medium to dark yellow.
RANGE Known from the type locality and from Santarém, Taperinha, Pará (R. L. Jeanne).
BIOLOGY The type colony was found by Forel nesting in soil beneath a bush.

Compare with *pubiventris, sensitiva, variegata*

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios (Stefan Cover and John E. Tobin). Scale bars = 1 mm.



Pheidole longiseta **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *longiseta,* long-haired.

DIAGNOSIS A medium-sized, brown species with extremely long, relative sparse, erect to suberect pilosity.

Major: the cephalic sculpturing is confined to the anterior half of the head and consists in part of rugoreticulum mesad to the eyes.

Minor: propodeal spine greatly reduced, pronotum smooth and shining.

Similar to *pubiventris, sensitiva,* and *variegata,* differing in many details of body form, sculpturing, and pilosity, as illustrated. See also the less similar *blumenauensis, rochai, seeldrayersi,* and *vafra.*

MEASUREMENTS (mm) Holotype major: HW 1.14, HL 1.16, SL 0.88, EL 0.18, PW 0.58.

Paratype minor: HW 0.62, HL 0.74, SL 0.98, EL 0.16, PW 0.42.

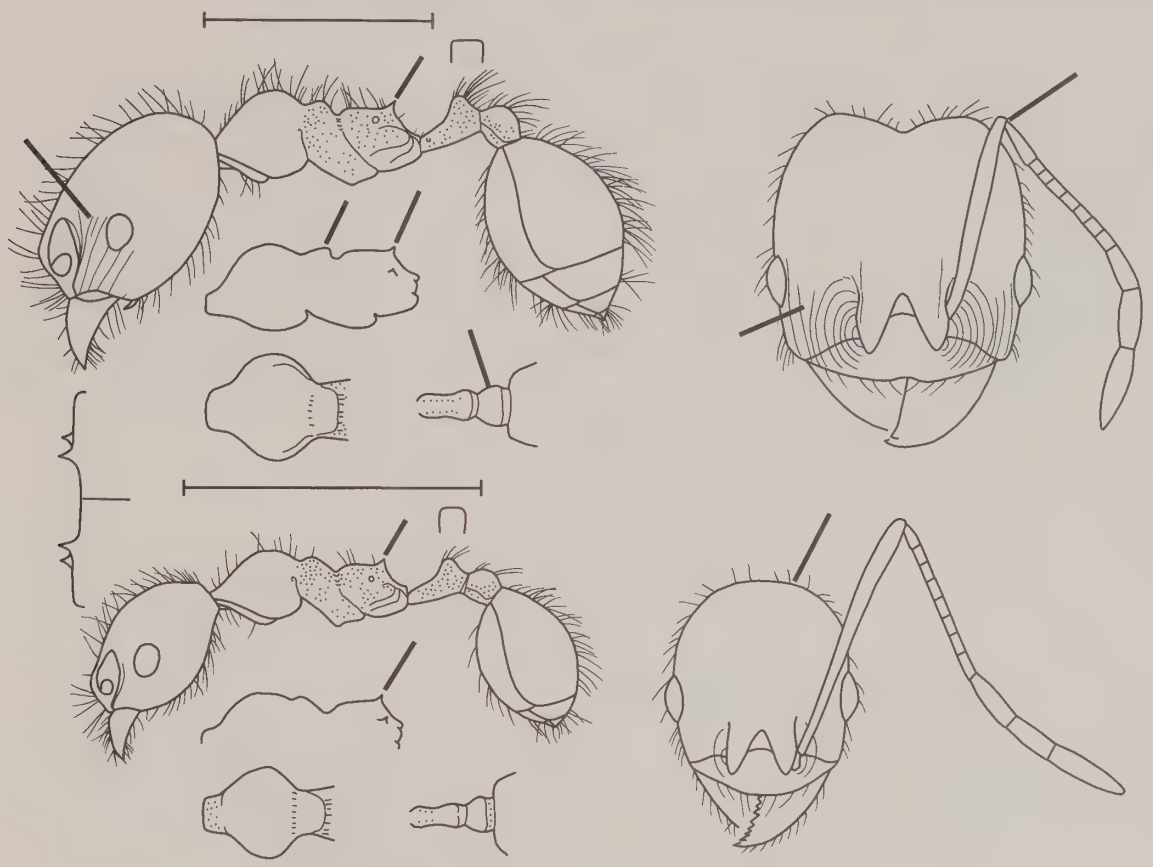
COLOR Major: body medium brown, appendages a slightly contrasting medium yellowish brown.

Minor: head, mesosoma, and peduncles of petiole and postpetiole dark brown; nodes of petiole and postpetiole, gaster, and appendages a contrasting medium brown.

RANGE Known from the type locality, and from 90 km north of Manaus, Amazonas, Brazil (E. O. Wilson).

BIOLOGY The type colony was nesting in a small white-wood rotten log on the floor of terra firme forest.

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios (Stefan Cover and John E. Tobin). Scale bars = 1 mm.

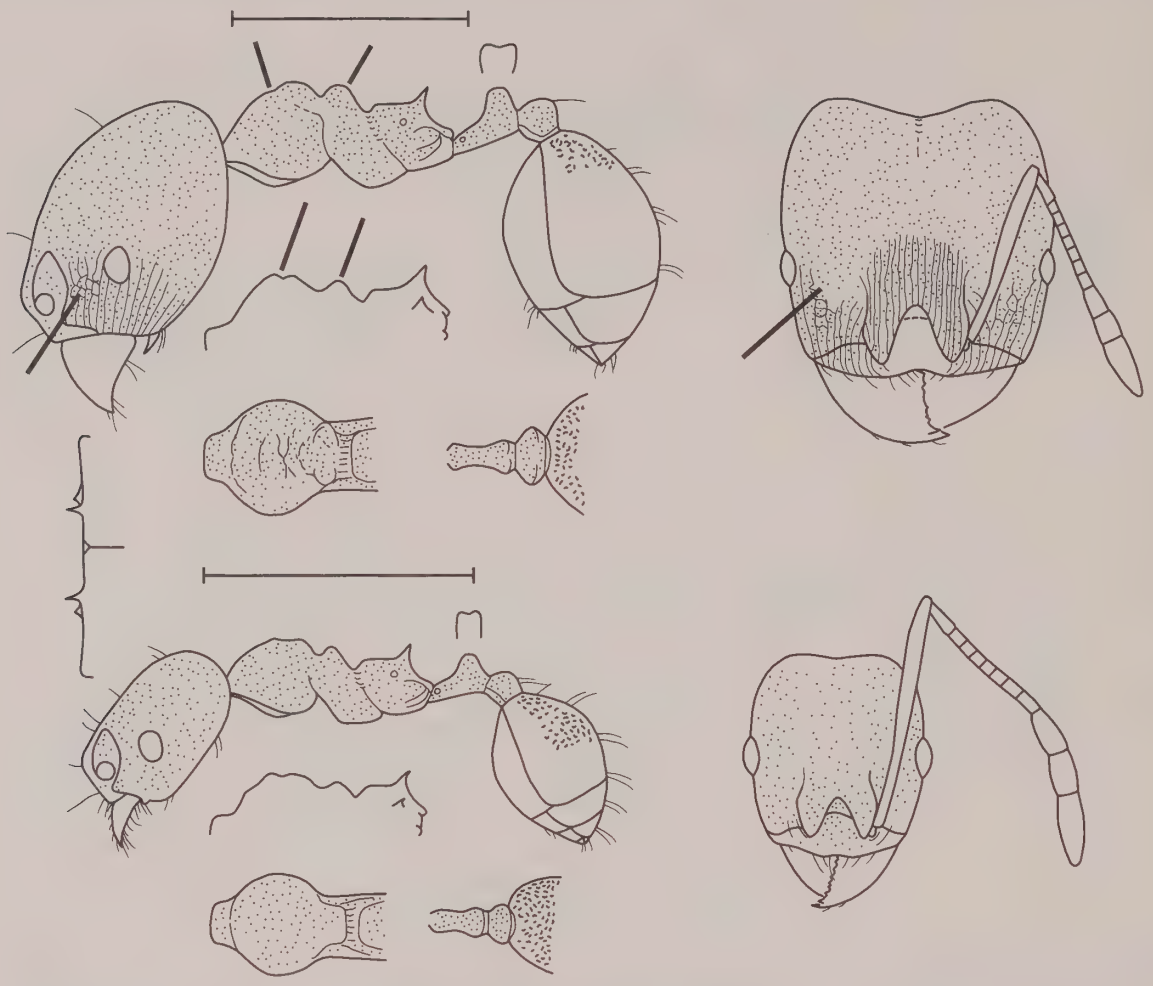


Pheidole machetula **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *machetula,* little warrior.
DIAGNOSIS A small member of the *diligens* group, similar to *calimana, cataractae, demeter, scimitara, sicaria,* and *tenuis* in various characters, differing as follows.
Major: small (HW 0.80 mm), with equilaterally triangular propodeal spines; antennal scape exceeds occipital corner by a little less than its own maximum width; head in full-face subrectangular, with nearly straight, parallel sides; carinulae on head do not extend posteriorly beyond eye level; in dorsal-oblique view, mesonotal convexity prominently lobose, its rounded apex directed posteriorly.
Minor: propodeal spines equilaterally triangular; occiput narrowed but lacking nuchal collar.
MEASUREMENTS (mm) Holotype major: HW 0.80, HL 0.86, SL 0.72, EL 0.18, PW 0.46.
Paratype minor: HW 0.46, HL 0.56, SL 0.64, EL 0.14, PW 0.30.
COLOR Major: body concolorous medium brown, legs light brown.
Minor: very dark, almost blackish brown; in some but not all minors, the mandibles, trochanters, and tarsi are clear yellow.
RANGE Known only from the type locality.
BIOLOGY The type colony was found in a gap in mature rainforest, nesting in bare clay soil.

Compare with *radoszkowskii*

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: El Alto de Ochomogo, 5 km east of Tres Rios, Cartago Prov. (J. Welch). Scale bars = 1 mm.

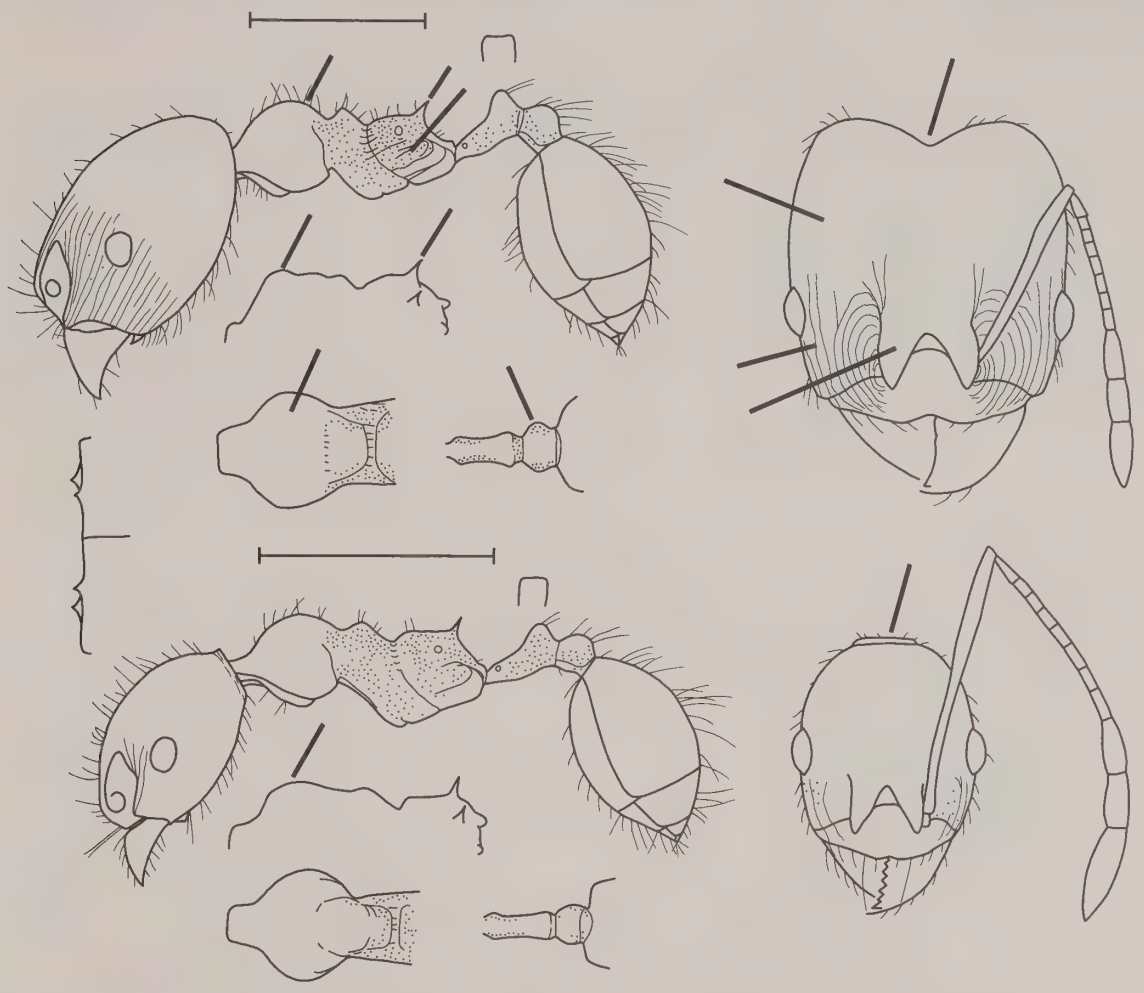


Pheidole medialis **new species**

TYPES INBio.
ETYMOLOGY L *medialis,* anatomically in center of a large species complex, from near the center of Costa Rica.
DIAGNOSIS Close to the widespread species *radoszkowskii,* and distinguished from it by reduced sculpturing on the head and pronotum, and much broader mesonotal convexity and petiolar node viewed from the side.
MEASUREMENTS (mm) Holotype major: HW 1.00, HL 1.08, SL 0.70, EL 0.18, PW 0.54.
Paratype minor: HW 0.46, HL 0.56, SL 0.64, EL 0.14, PW 0.30.
COLOR Major: light brown, rest of body dark yellow, appendages medium yellow.
Minor: gaster medium brown, rest of body and appendages brownish yellow.
RANGE Known only from the type series.
BIOLOGY Unknown.

Compare with *coffeicola, davidsonae, gagates, hoelldobleri, peregrina, spilota, venatrix, zelata*

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: Estación Biológica Los Tuxtlas, 10 km north-northwest of Sontecomapan, 18°35′N 95°05′W, 200 m (Philip S. Ward). Scale bars = 1 mm.



Pheidole mooreorum **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named in honor of Gordon and Betty Moore, in recognition of their outstanding contribution in service and support to tropical conservation, hence the habitats in which the Pheidole ants will continue to exist.

DIAGNOSIS A member of the *diligens* group, similar in various characters to the species listed in the heading above, distinguished as follows.

Major: head and body overall richly pilose; sides of head in full-face view relatively straight and parallel; mesonotal convexity prominent, its apex seen from the side tilted forward; humerus in dorsal-oblique view lobose, and pronotum weakly bilobose; postpetiole elliptical from above; rugoreticulum absent from head, and carinulae absent from frontal lobes.

Minor: occiput narrowed, with nuchal collar; dorsal promesonotal profile in dorsal-oblique view smoothly rounded; head and body abundantly pilose.

MEASUREMENTS (mm) Holotype major: HW 1.12, HL 1.24, SL 0.86, EL 0.20, PW 0.62.
Paratype minor: HW 0.66, HL 0.78, SL 0.94, EL 0.14, PW 0.44.

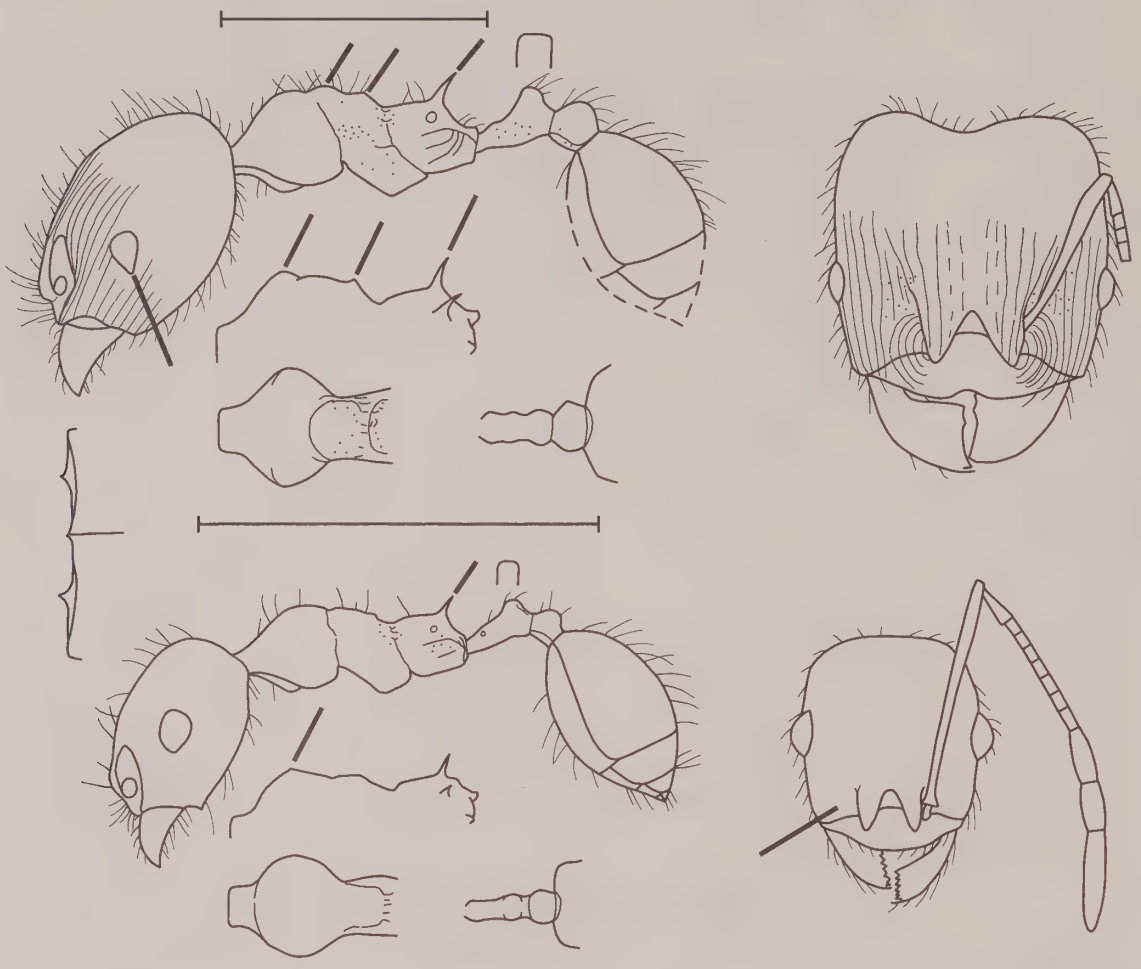
COLOR Major: head and body rich medium reddish brown, appendages light reddish brown.
Minor: head and body plain dark brown; appendages light to yellowish brown except for tarsi, which are yellow.

RANGE Known only from the type locality.

BIOLOGY Majors and minors from the type colony were foraging on the ground in lowland rainforest.

Compare with *accinota, alpestris, cameroni*

FIGURE Upper: holotype, major. Lower: paratype, minor. DOMINICAN REPUBLIC: Cabo Rojo, 17°54′N 71°40′W, 5 m (Philip S. Ward). Scale bars = 1 mm.



Pheidole noar **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *noar,* phantom.

DIAGNOSIS A member of the *diligens* group, somewhat similar to *accinota, alpestris,* and *cameroni* of South America, but very distinct from these and other species of the group in the following combination of traits.

Major: body concolorous yellow, appendages pale yellow; eye pear-shaped, coming to a small point at its anterior edge; propodeal spine half as long as the basal propodeal face; body almost entirely smooth and shiny.

Minor: pale yellow; propodeal spine thin, needle-like; humerus in dorsal-oblique view denticulate; body almost completely smooth and shiny; carinulae completely absent from head and body, including antennal fossae.

MEASUREMENTS (mm) Holotype major: HW 1.04, HL 1.10, SL 0.70, EL 0.20, PW 0.50.
Paratype minor: HW 0.42, HL 0.48, SL 0.60, EL 0.10, PW 0.28.

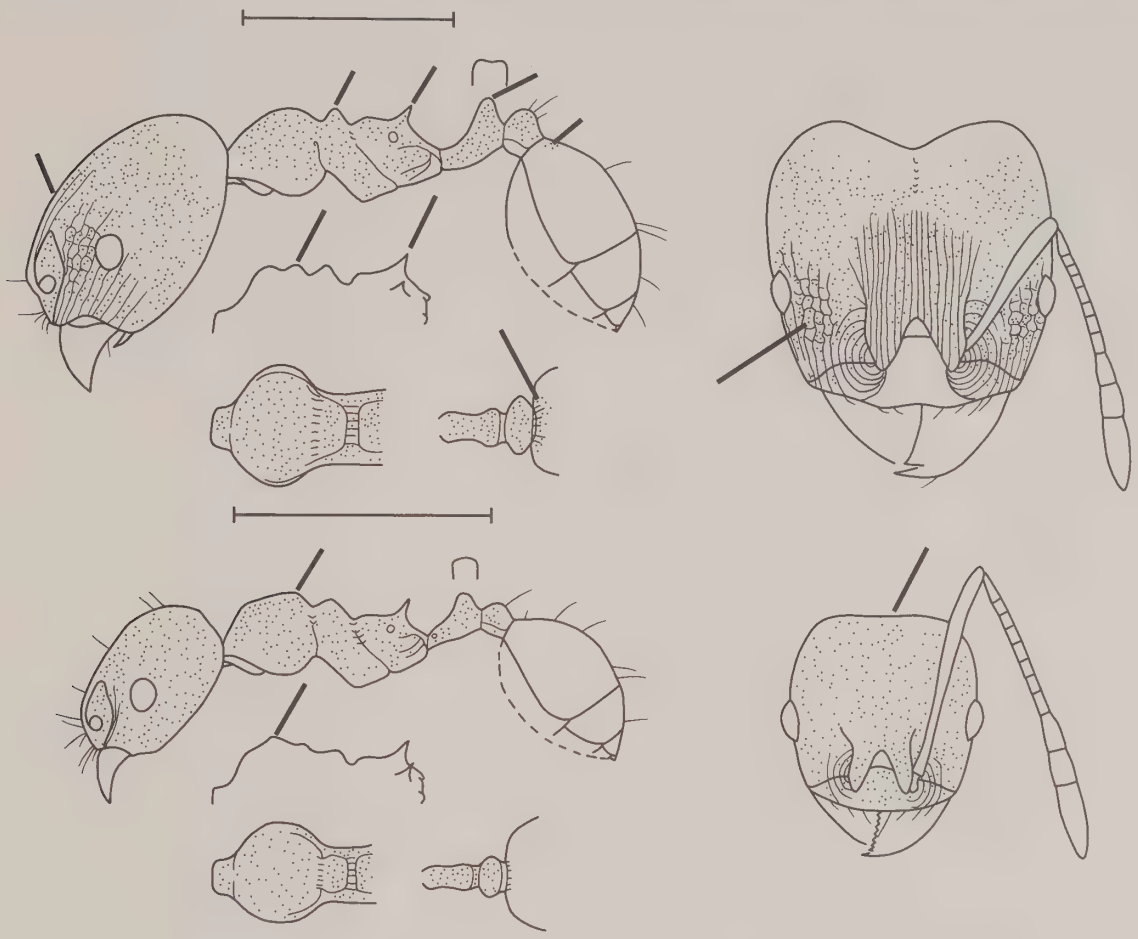
COLOR Major: concolorous yellow, mandibles brownish yellow, other appendages pale yellow.
Minor: body and appendages concolorous pale yellow.

RANGE Known only from the type locality.

BIOLOGY Discovered by Philip S. Ward foraging on the ground in the Cabo Rojo coastal desert. Its pale color suggests that this surprising species is probably nocturnal. A male was collected with the type colony (9 September).

Compare with *triconstricta,* and other species listed in the Diagnosis below

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ARGENTINA: Salta (no further locality). Scale bars = 1 mm.

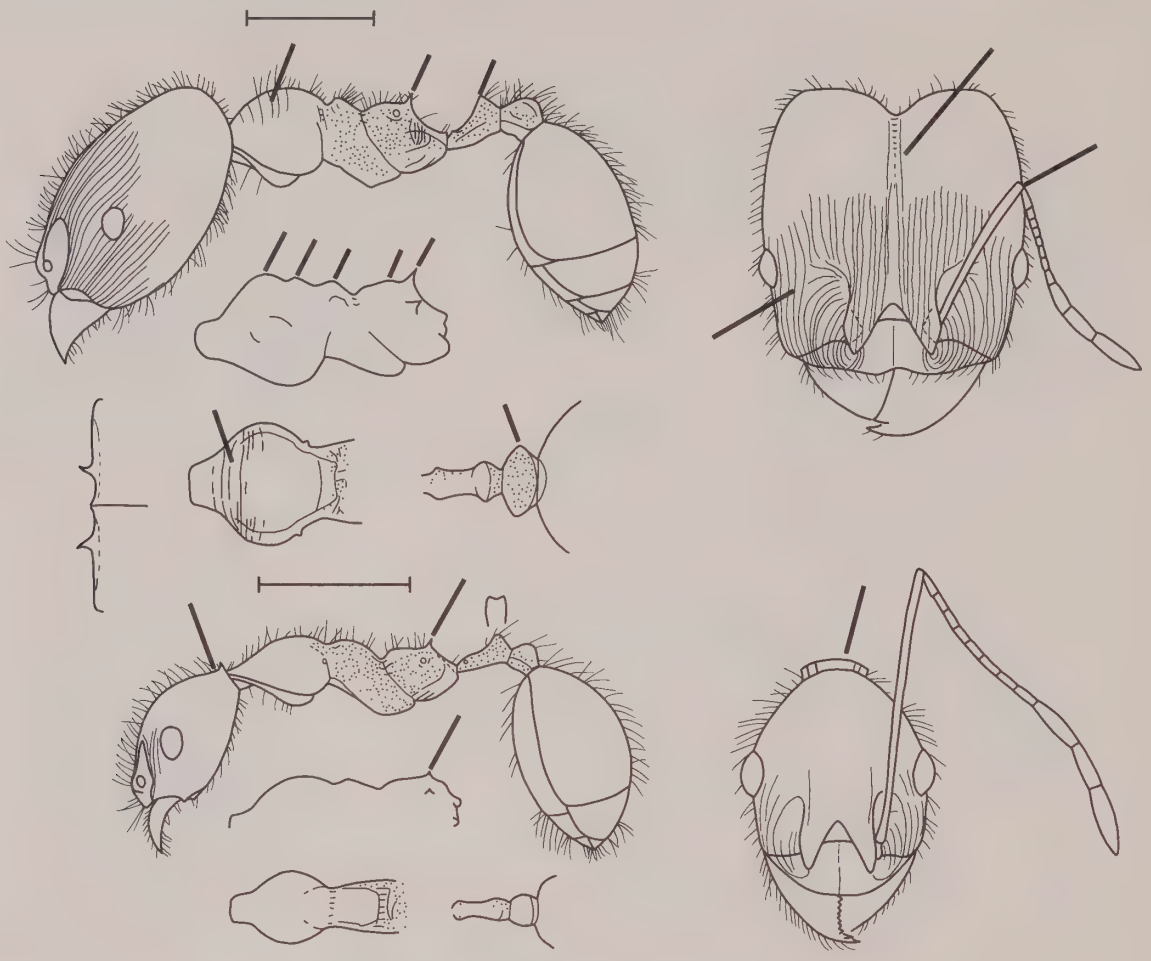


Pheidole nubila Emery, **new status**

Pheidole triconstricta var. *nubila* Emery 1906c: 153.

TYPES Mus. Civ. Stor. Nat. Genova.
ETYMOLOGY L *nubila,* cloudy, probably referring to the more foveolate and opaque condition of the body that distinguishes the form from *triconstricta*.
DIAGNOSIS A member of the *diligens* group distinguished as follows.
Major: pronotal dorsum bilobous (hence, promesonotum trilobous) in dorsal-oblique view; extremely sparse pilosity, which is entirely absent on the mesosoma; dense longitudinal carinulae covering all the frontal lobes and extending back over the vertex; rugoreticulum mesad to the eyes.
Minor: all of body except the gaster foveolate and opaque; pronotum with a second convexity in dorsal-oblique view.
Close to *triconstricta,* differing (among other traits) in the more extensive foveolae and carinulae, as well as thinner petiolar node, of the major; and darker color of both castes (q.v.).
See also *anima, diligens, gagates, piceonigra, radoszkowskii,* and *stigma*.
MEASUREMENTS (mm) Lectotype major: HW 1.14, HL 1.18, SL 0.72, EL 0.20, PW 0.56.
Paralectotype minor: HW 0.56, HL 0.64, SL 0.74, EL 0.14, PW 0.38.
COLOR Major and minor: reddish brown.
RANGE Besides the type locality (Salta), Kempf (1972b) lists Argentine records from Córdoba, Jujuy, and Santa Fé.
BIOLOGY Unknown.

FIGURE Upper: syntype, major. Lower: syntype, minor. PARAGUAY: San Bernadino (Fiebring). Scale bars = 1 mm.

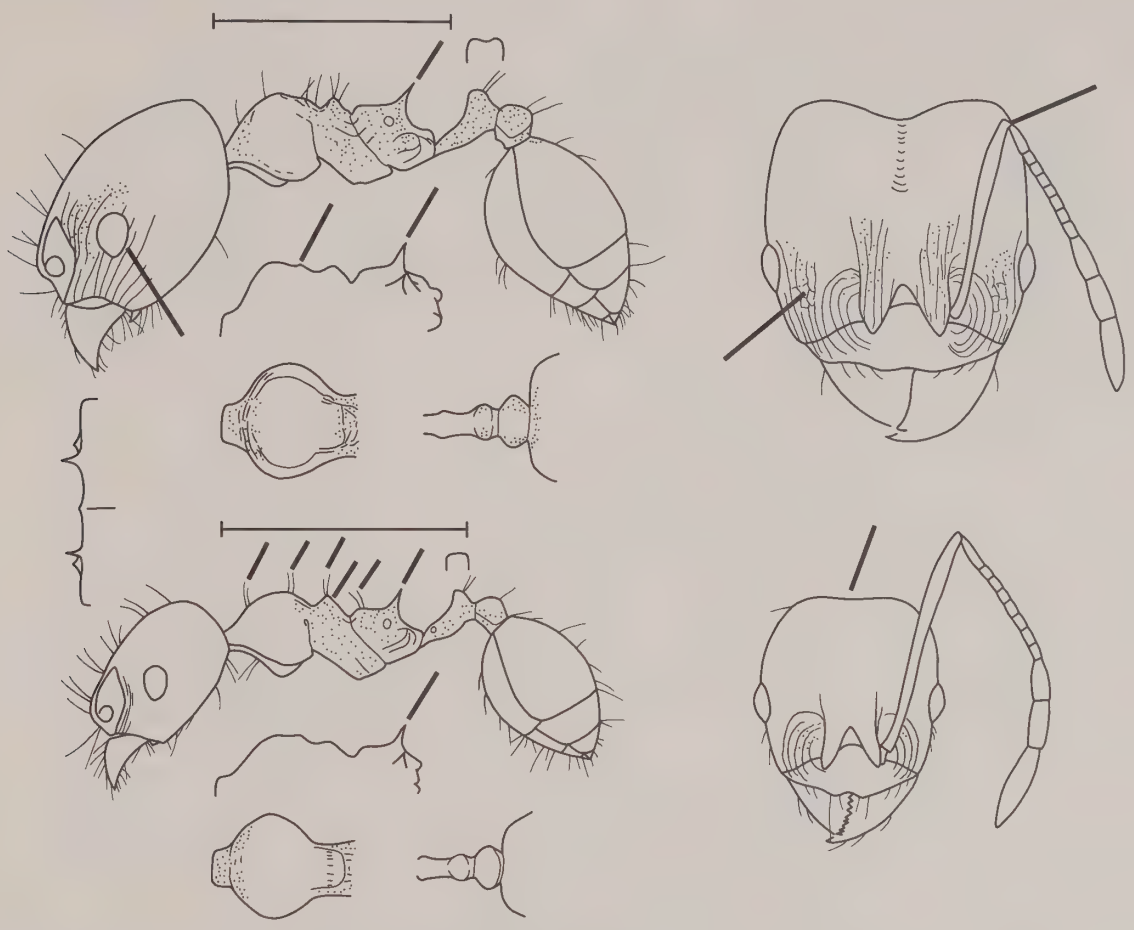


Pheidole oxyops Forel

Pheidole oxyops Forel 1908h: 377. Syn.: *Pheidole genalis* Borgmeier 1929: 199, synonymy by Kempf 1964e: 58; *Pheidole oxyops* subsp. *regia* Forel 1908h: 378, synonymy by Kempf 1964e: 58.

TYPES Mus. Hist. Nat. Genève; Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *oxyops,* sharp-eyed or sharp-faced, allusion uncertain.
DIAGNOSIS A large (major Head Width 1.90 mm), reddish brown member of the *diligens* group easily distinguished as follows.
Major: head in side view elliptical, tapering equally toward the occiput and clypeus on opposite ends; antennal scape reaches much less than half the distance from eye to occipital corner; in dorsal-oblique view, the two lobes of the pronotum and mesonotal convexity present a profile of three equally spaced convexities, and the propodeal dorsum has a small convexity just anterior to the spine; in side view propodeal spine short, thin, and vertical to propodeal dorsal face; postpetiole from above conulate; no rugoreticulum present anywhere; anterior and parts of lateral margins of pronotum carinulate.
Minor: a neck and nuchal collar present; propodeal spine reduced almost to a denticle.
MEASUREMENTS (mm) Syntype major: HW 1.92, HL 2.12, SL 1.06, EL 0.30, PW 0.80.
Syntype minor: HW 0.74, HL 1.02, SL 1.24, EL 0.22, PW 0.54.
COLOR Major and minor: concolorous light brown.
RANGE Kempf (1972b) and I have recorded *oxyops,* in addition to the type series from Paraguay, from Salta, northern Argentina, and Goiás, Mato Grosso, Minas Gerais, and São Paulo in southeastern and central Brazil.
BIOLOGY *P. oxyops* occurs in *cerrado* (savanna) and the edges of semideciduous forest. In the region of San Antonio de Posse, São Paulo, Fernandes et al. (1994) found the species abundant along the forest edge and in cotton fields. In the latter it was very effective in removing adult boll weevils *(Anthonomus grandis)* from the ground, accounting in one study period for 90% of the predation due to ants, where predation by ants as a whole destroyed 20% of the weevils. Fernandes et al. use the name *P. oliveirai,* which I erroneously supplied from an early draft of the manuscript of my monograph; the specimens supplied me and hence the name I erected in manuscript fall under *oxyops*.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Sirena, Corcovado National Park, Osa Peninsula (Stefan Cover). Scale bars = 1 mm.

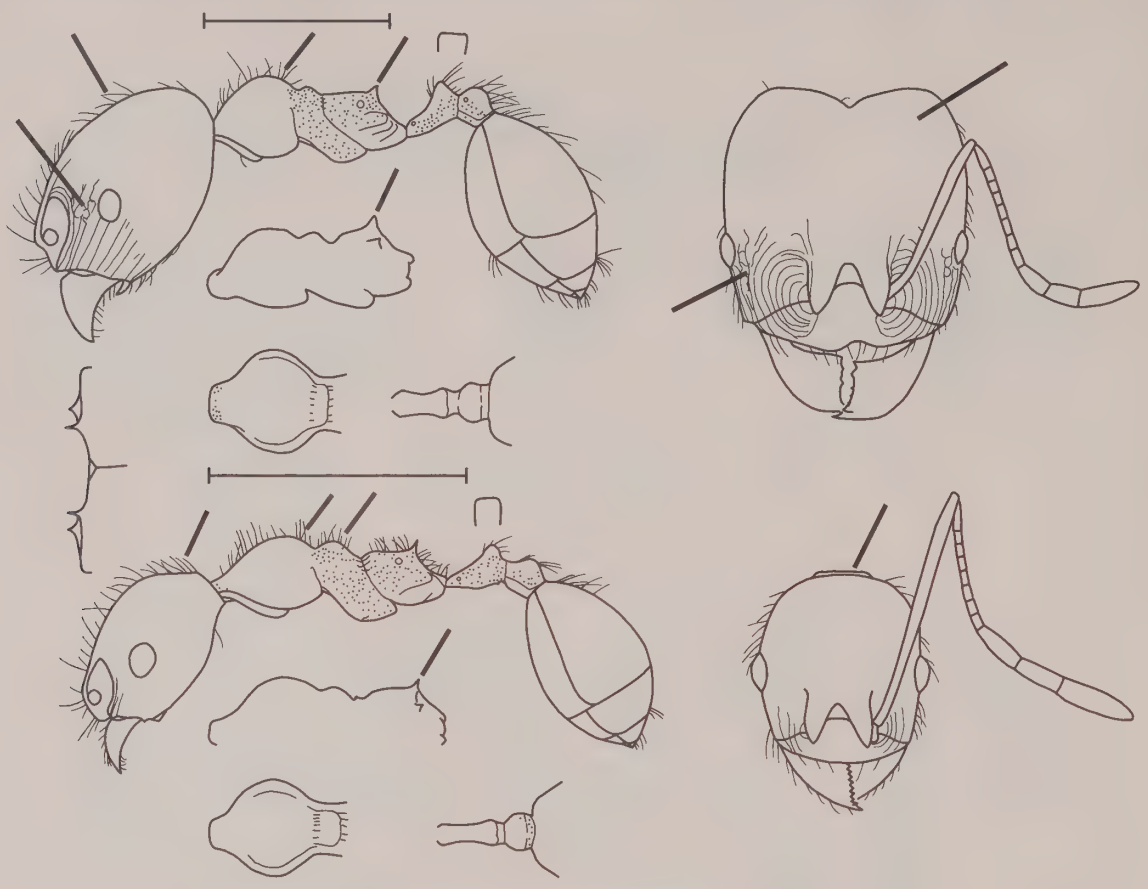


Pheidole perdiligens **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *perdiligens,* more careful, diligent.
DIAGNOSIS A member of the *diligens* group close to *anima, indistincta, piceonigra* and *tschinkeli,* distinguished as follows.
Major: antennal scape approaches occipital corner to within its own maximum width; propodeal spines half as long as the basal propodeal face anterior to them; rugoreticulum present between eye and antennal fossa; eye proportionately large (Eye Length/Head Width 0.21); humerus rounded and pronotum weakly bilobous in dorsal-oblique view.
Minor: propodeal spines nearly half as long as basal propodeal face; pilosity of dorsal mesonotal profile composed of regularly spaced pairs of setae; occiput broad.
MEASUREMENTS (mm) Holotype major: HW 0.94, HL 0.94, SL 0.72, EL 0.20, PW 0.48.
Paratype minor: HW 0.52, HL 0.58, SL 0.72, EL 0.12, PW 0.34.
COLOR Major: head and gaster light to medium reddish brown; mandibles, mesosoma, and waist yellowish brown; other appendages medium yellow.
Minor: head and gaster brownish yellow, rest of body and appendages medium yellow.
RANGE Known only from the type locality, and from San Blas, Panama.
BIOLOGY The type colony was found in a rotting branch on the floor of lowland rainforest.

Compare with species listed in the Diagnosis below

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Isla São Sebastião, São Paulo. Scale bars = 1 mm.



Pheidole peregrina Wheeler

Pheidole peregrina Wheeler 1916p: 181. Syn: *Pheidole impariceps* Santschi 1923d: 47, n. syn.; *Pheidole impariceps* var. *fusciclava* Santschi 1923d: 48, n. syn.

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *peregrina,* traveling, foreign. Referring to discovery of the type colony on a floating log.

DIAGNOSIS A small, yellow member of the *diligens* group whose major has posterior two-thirds of head capsule smooth and shiny, rugoreticulum present as a small patch just mesad to the eye, moderately abundant pilosity, and short equilaterally triangular propodeal spine in side view.

Similar to *blumenauensis, laevifrons, mooreorum, rochai,* and *vafra,* differing in many details of body form, sculpturing, and pilosity, as figured.

See also the somewhat less similar *lemur, pubiventris, seeldrayersi, spilota, variegata, venatrix,* and *zelata*.

MEASUREMENTS (mm) Lectotype major: HW 1.00, HL 1.06, SL 0.74, EL 0.14, PW 0.56.

Paralectotype minor: HW 0.54, HL 0.64, SL 0.76, EL 0.14, PW 0.36.

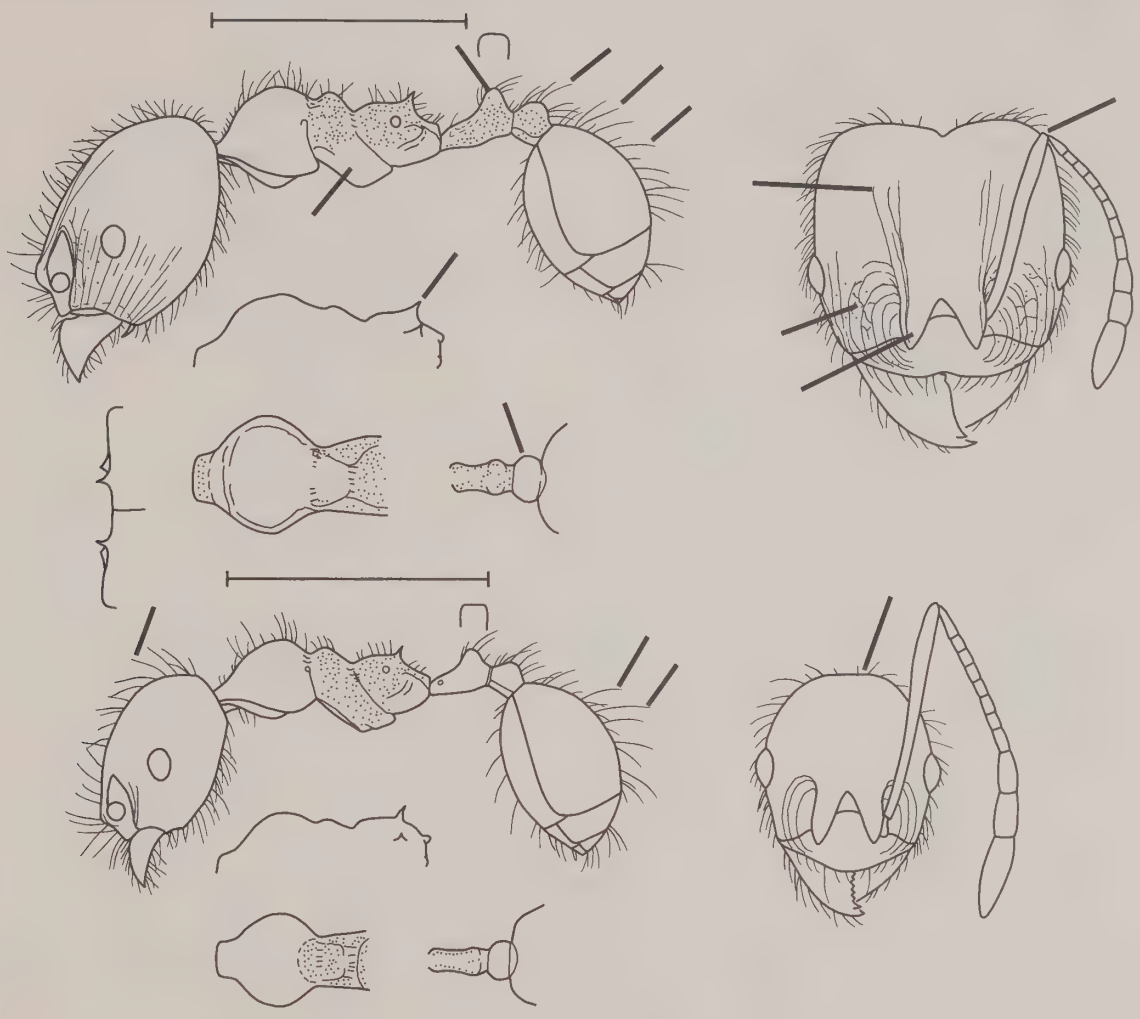
COLOR Major: concolorous dark yellow.

Minor: head light brownish yellow, rest of head and appendages clear dark yellow.

RANGE Known from several localities in São Paulo state.

BIOLOGY On the type series, by Hermann von Ihering, as quoted by W. M. Wheeler (1916: 180–181): "One morning, while [Mr. Gaste, a local naturalist] was on the island of San Sebastian, he found a tree trunk that had floated to the shore during the night and was filled with a living ant-colony belonging to a species of *Pheidole* [*peregrina* Wheeler] unknown to me. San Sebastian is situated some kilometers off the coast of the mainland. Of course, we cannot say how long this log had been floating in the water before it reached the island." It may be that *peregrina,* like the anatomically similar and widespread *vafra,* is a specialist in marginal habitats. The types of the synonymous *impariceps* var. *fusciclava* were collected on another island in the same area, Ilha dos Alcatrazes.

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: Cachoeira das Emas (EEBP), Mun. Piraçununga, São Paulo (William L. Brown). Scale bars = 1 mm.



Pheidole perryorum **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named in honor of Noel Perry and family, in recognition of their outstanding contribution in service and support to tropical conservation, hence the habitats in which the Pheidole ants will continue to exist.

DIAGNOSIS A member of the *diligens* group similar in various characters to *blumenauensis, rochai,* and *vafra,* differing as follows.

Major: yellow; antennal scape just reaches occipital corner; pilosity of waist and gastral dorsum dense, consisting in part of hairs longer than Eye Length; propodeal spines in dorsal-oblique view directed strongly backward; postpetiole oval from above; rugoreticulum absent on head; several carinulae originating on frontal lobes travel more than halfway the distance between eye level and occiput; lower half of mesopleuron smooth and shiny.

Minor: occiput greatly narrowed but lacking nuchal collar; many hairs on head and gaster longer than Eye Length.

MEASUREMENTS (mm) Holotype major: HW 0.94, HL 0.96, SL 0.76, EL 0.14, PW 0.46.
Paratype minor: HW 0.56, HL 0.64, SL 0.76, EL 0.14, PW 0.36.

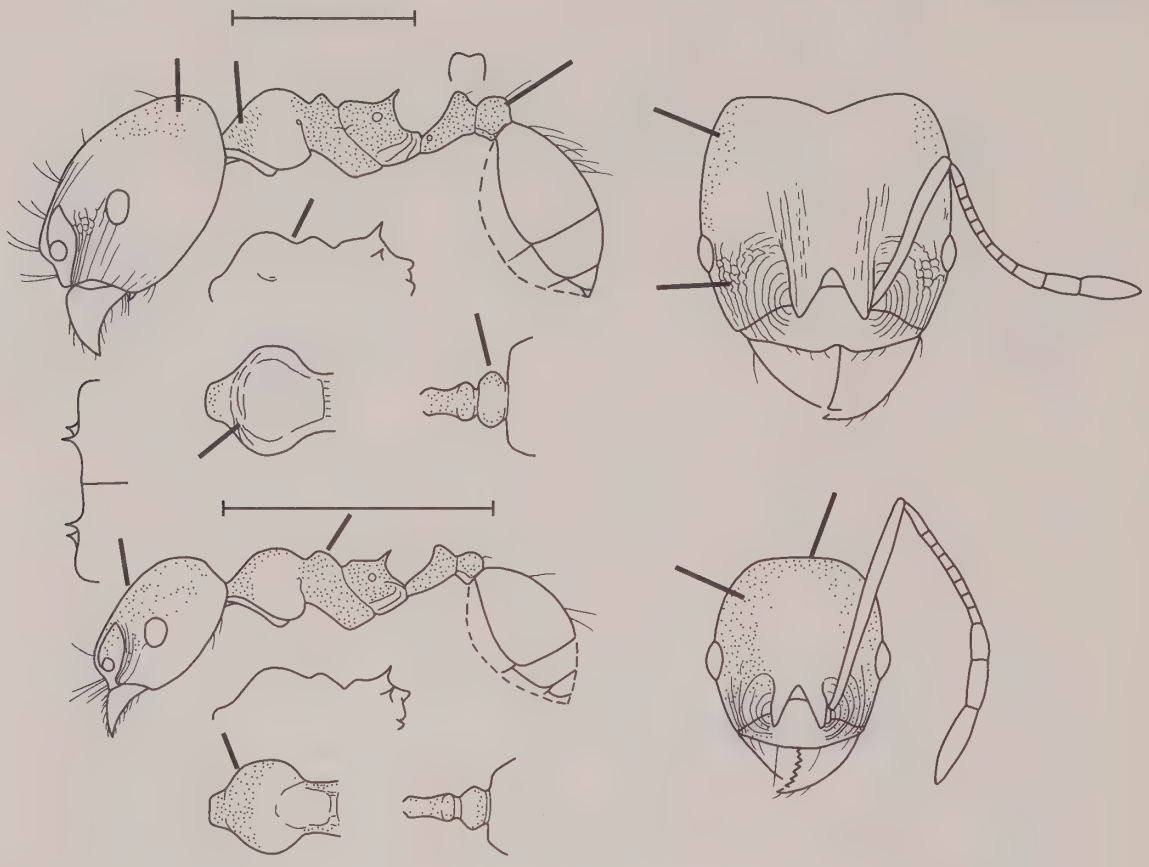
COLOR Major and minor: concolorous medium yellow.

RANGE Known only from the type locality.

BIOLOGY The type colony was found in a lowland swamp forest.

Compare with *anima, indistincta, perdiligens, tschinkeli*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. MEXICO (no further data). Scale bars = 1 mm.

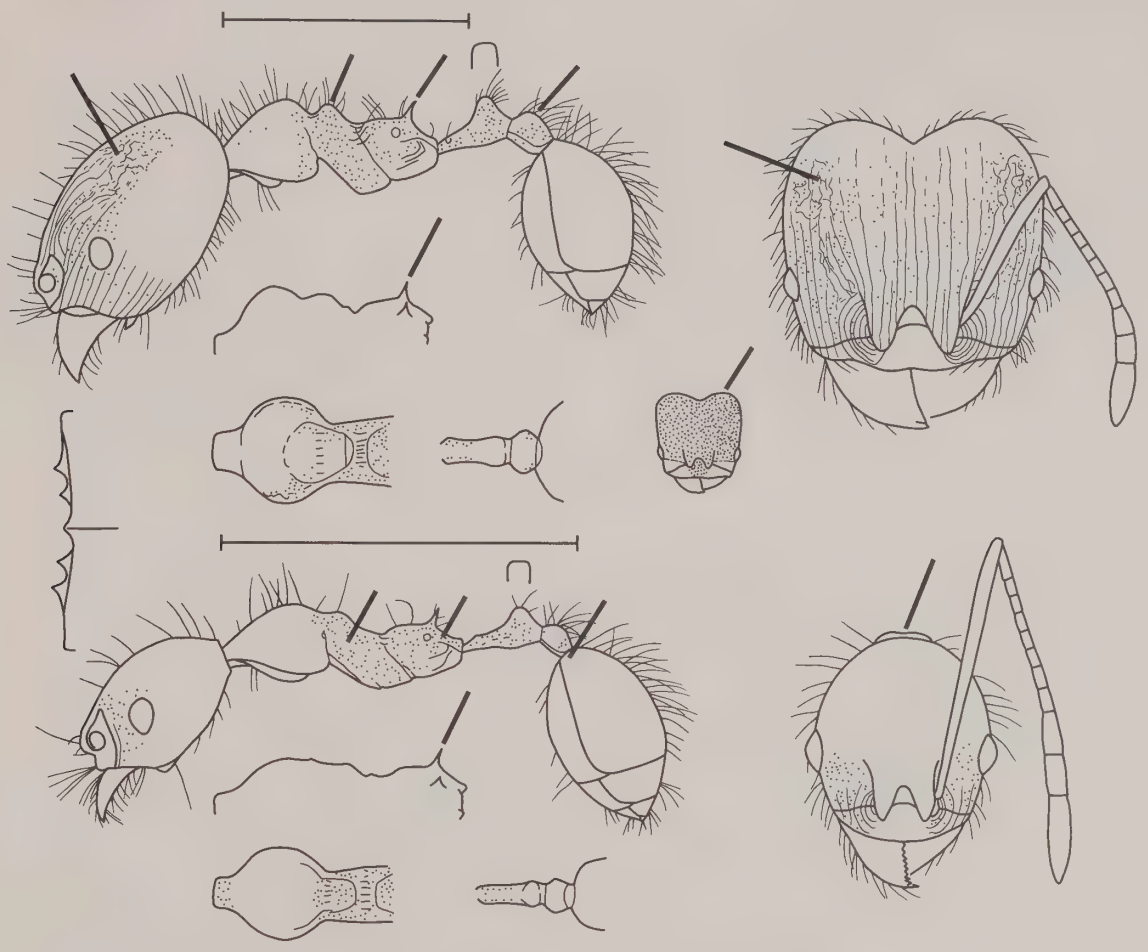


Pheidole piceonigra Emery

Pheidole piceonigra Emery 1922c: 109. Replacement name for *picea* Mayr 1870b: 988, junior secondary synonym of *Atta picea* Buckley 1867: 344.

TYPES Naturhist. Mus. Wien (under *picea* Mayr).
ETYMOLOGY L *piceonigra,* pitch-black plus black.
DIAGNOSIS Close to *indistincta* of Costa Rica, considered by Longino (1997) to belong with it in a single, very variable species. The types, however, are very different, with those of *piceonigra* distinguished as follows.
Major: *piceonigra* with much less abundant pilosity than *indistincta*; rugoreticulation between eye and antennal fossa; color much darker (see Color below), and head concolorous, not bicolorous as in *indistincta*; posterior side of head with bands of foveolae; humerus in dorsal-oblique view rounded; apex of postpetiole in side view more rounded.
Minor: occiput and posterior sides of head foveolate, not smooth as in *indistincta*; much less pilose than *indistincta*; color much lighter.
If continuous intergrades are demonstrated between the two forms, they may be joined; otherwise it is more prudent to distinguish them as species.
MEASUREMENTS (mm) Lectotype major: HW 1.06, HL 1.04, SL 0.76, EL 0.20, PW 0.54.
Paralectotype minor: HW 0.62, HL 0.70, SL 0.80, EL 0.14, PW 0.40.
COLOR Major: body dark brown, gaster almost black.
Minor: head, mesosoma, and waist dark reddish brown; propodeum and gaster blackish brown; appendages medium brown.
RANGE I have seen series from Chiapas, Tamaulipas, and Veracruz in Mexico, at 1070–2200 m, and from Costa Rica. On the basis of the types, I am considering this species as different from *indistincta,* which also occurs in Costa Rica.
BIOLOGY Longino's notes (1997) on the distribution and natural history of *"indistincta"* may apply to that species, to *piceonigra,* or to both. I found a large, undoubted *piceonigra* colony nesting at the base of an ornamental shrub in a much disturbed San José city park. In Tamaulipas, the Cornell University Mexico Field Party of 1965 encountered it at 1070 m in tall cloud forest.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (Leeanne E. Tennant-Alonso). Scale bars = 1 mm.



Pheidole prostrata **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *prostrata,* low, flattened, alluding to the low mesonotal convexity and postpetiolar node of the minor in side view.

DIAGNOSIS **Major**: varicolored, with bicolorous head; dorsolateral areas of head anterior to the occiput weakly rugoreticulate, with the dorsal head surface between the rugoreticular patches longitudinally carinulate; dorsal pilosity of body dense, long, and erect; propodeal spine long and thin.

Minor: mesonotal convexity and postpetiolar node in side view flattened; dorsal pilosity of head and mesosoma sparse, long, and erect.

Similar to *aculifera* (in the *fallax* group), whose major has a rugoreticulum mesad to the eyes but not just anterior to occiput, with the posterior half of the head foveolate only, and neither carinulate nor foveolate as in *prostrata*. The propodeal spiracle is very small in the major compared to that of *aculifera*.

See also the less similar *boruca, variegata,* and *violacea*.

MEASUREMENTS (mm) Holotype major: HW 1.12, HL 1.12, SL 0.80, EL 0.16, PW 0.48.

Paratype minor: HW 0.48, HL 0.64, SL 0.82, EL 0.14, PW 0.32.

COLOR Major: head bicolorous, with clypeus and capsule posterior to anterior margins of eyes light brown, and rest of capsule brownish yellow; gaster and waist light brown; mesosoma brownish yellow; legs yellow.

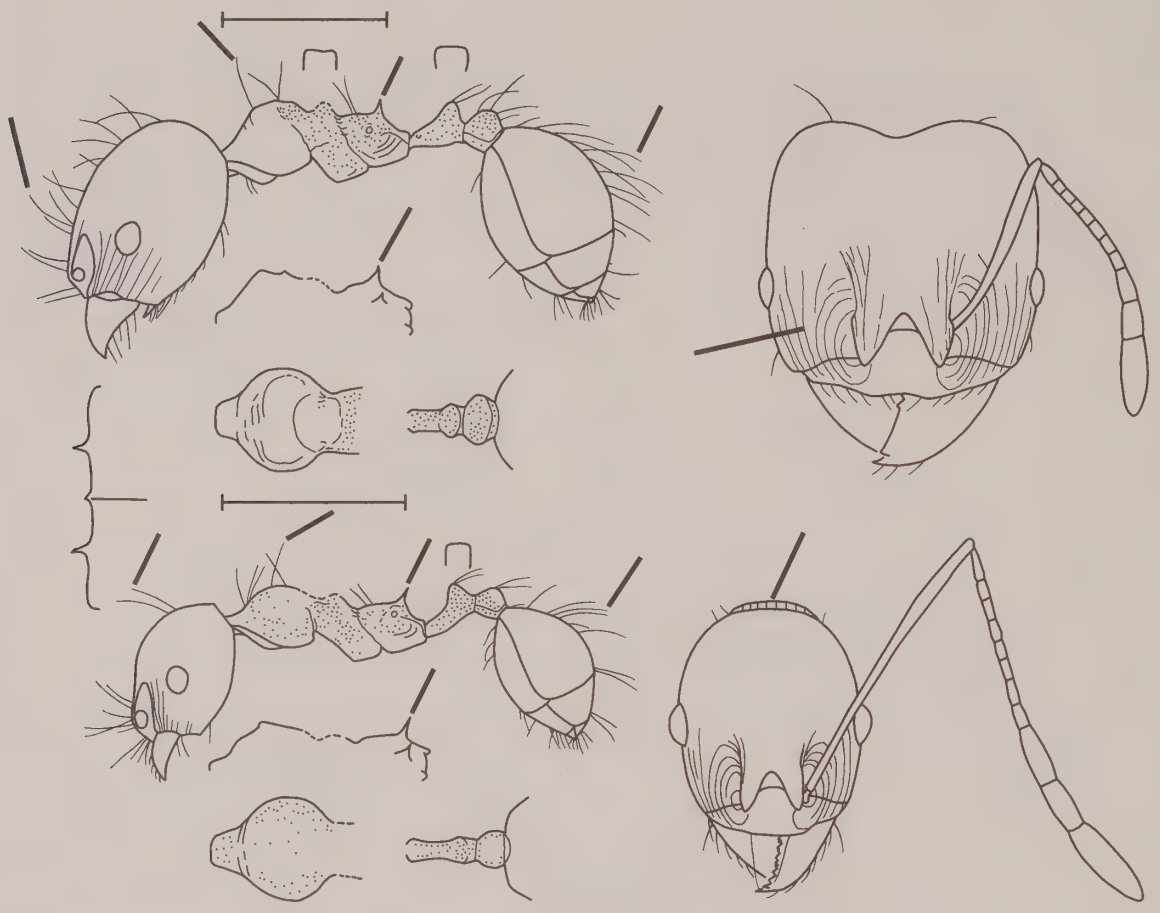
Minor: head posterior to eyes, as well as postpetiole and gaster, light brown; mesosoma, anterior margin of head capsule, and petiole brownish yellow; appendages yellow.

RANGE Atlantic lowlands of Costa Rica (J. T. Longino 1997).

BIOLOGY According to Longino (1997), *prostrata* nests in the low arboreal zone, within a few meters of the ground, in mature wet forest. It apparently does not forage onto the ground.

Compare with *longiseta, sensitiva, variegata*

FIGURE Upper: syntype, major. Lower: syntype, minor. BRAZIL: Santa Catarina. (The specimens shown are in the Museum of Comparative Zoology, Harvard University). Scale bars = 1 mm.

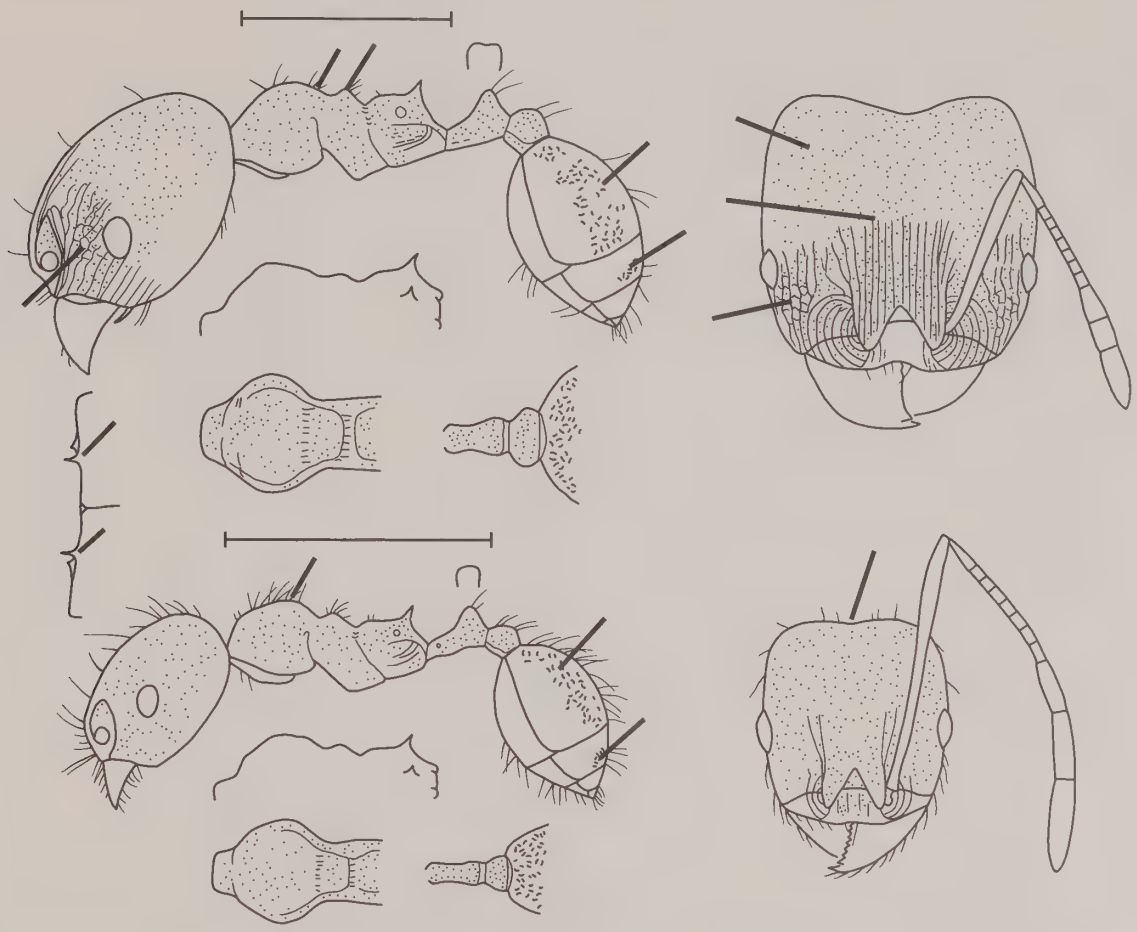


Pheidole pubiventris Mayr

Pheidole pubiventris Mayr 1887: 595, 604, 607. Syn.: *Pheidole pubiventris* r. *cearensis* Forel 1901j: 353, n. syn.; *Pheidole pubiventris* var. *nevadensis* Forel 1901j: 353, n. syn.; *Pheidole pubiventris* r. *timmii* Forel 1901m: 62, n. syn. (Types not seen: *Pheidole pubiventris* var. *foederalis* Borgmeier 1928a: 34.)

TYPES Naturhist. Mus. Wien; Mus. Comp. Zool. Harvard.
ETYMOLOGY L *pubiventris,* hairy belly, evidently alluding to the conspicuously long pilosity of the gaster.
DIAGNOSIS A medium-sized brown member of the *diligens* group with relatively sparse, extremely long, erect to suberect curving hairs over the dorsa of the head and body.
Major: sculpturing of head consists entirely of carinulae, which are confined to the anterior half of the head capsule; promesonotal profile trilobous and pronotal humerus subangulate in dorsal-oblique view.
Minor: humerus angulate; pronotum mostly foveolate and opaque.
Similar to *longiseta, sensitiva*, and *variegata*; differing in many details of body form, sculpturing, and pilosity, as illustrated.
See also the less similar *blumenauensis, rochai, seeldrayersi,* and *vafra*.
Majors from Colombia have shorter pilosity and more angulate humeri than the Brazilian series; and thus may represent a distinct species.
MEASUREMENTS (mm) Syntype major (Mus. Comp. Zool. Harvard): HW 1.14, HL 1.12, SL 0.86, EL 0.22, PW 0.56.
Syntype minor (Mus. Comp. Zool. Harvard): HW 0.54, HL 0.68, SL 0.86, EL 0.16, PW 0.40.
COLOR Major: light reddish yellow (probably a callow or faded; fresher specimens are blackish brown).
Minor: body medium brown, with light brown appendages (fresher specimens are blackish brown).
RANGE Santa Catarina, São Paulo, and Ceará, Brazil; and Magdalena, Colombia.
BIOLOGY The localities, combined with a note accompanying a specimen from El Campano, Magdalena, Colombia ("in road," W. L. Brown), suggests that this species may be adapted to disturbed habitats. A winged queen was collected at El Campano in June.

FIGURE Upper: major. Lower: minor. EL SALVADOR: 2–4 km south of Quetzaltepeque (William L. Brown), compared with syntypes. Scale bars = 1 mm.



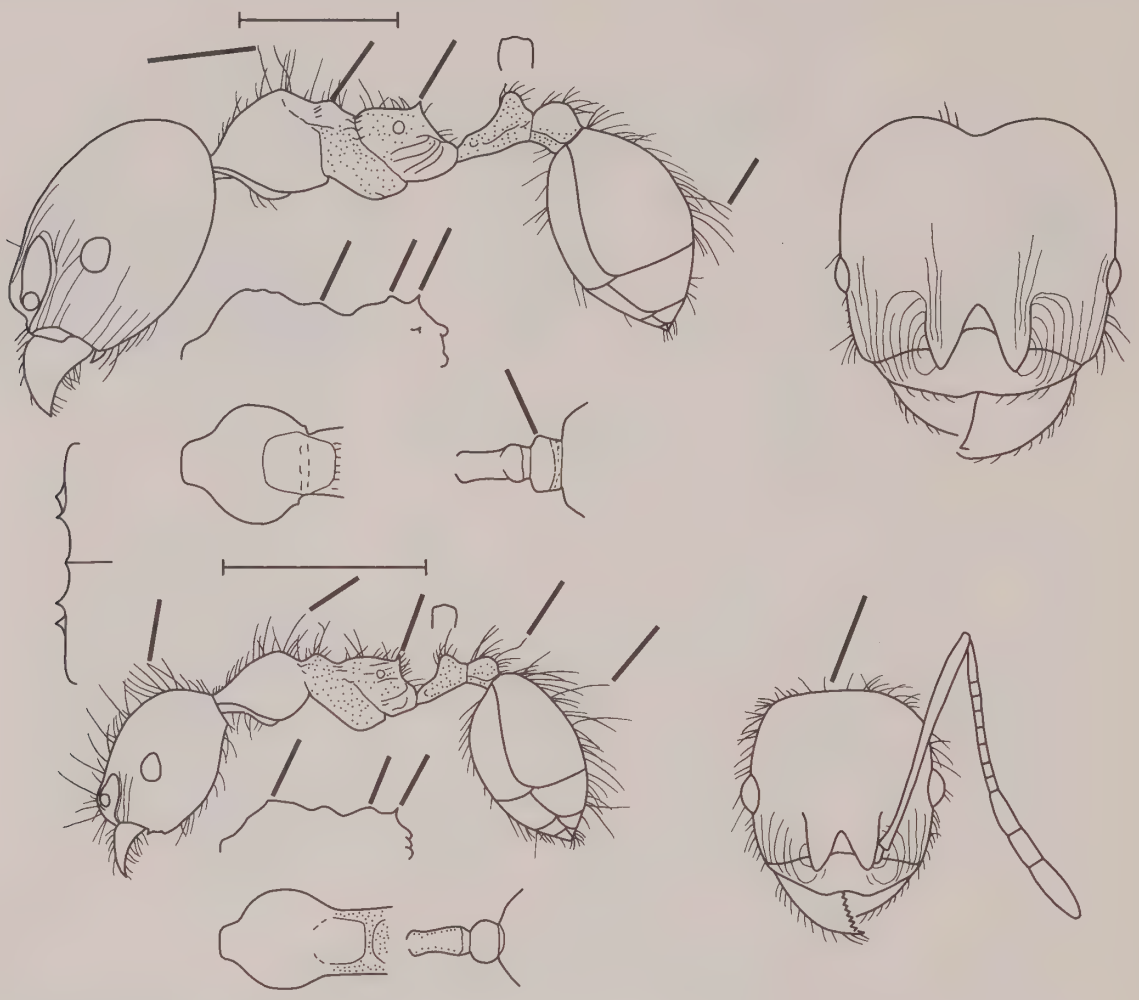
Pheidole pugnax Dalla Torre, **new status**

Pheidole radoszkowskii subsp. *pugnax* Dalla Torre 1892: 91. Replacement name for *P. militaris* Emery 1890c: 49, a junior primary homonym of *P. militaris* F. Smith 1860a: 74.

TYPES Mus. Civ. Hist. Nat. Genova; Nat. Mus. Nat. Hist. U. S.
ETYMOLOGY L *pugnax,* combative.
DIAGNOSIS A member of the *diligens* group very similar to the more widespread *radoszkowskii,* as well as *diligens,* and distinguished as follows.
Major: promesonotal dorsum hairy; space between eye and antennal fossa rugoreticulate; carinulae of frontal lobes extend posteriorly beyond eye level only about a single Eye Length; all of dorsal surface of head except frontal triangle and all of mesosoma and waist foveolate and opaque; three-fourths to all of central strip of first gastral tergite and the posterior central strip of second shagreened; pronotum in dorsal-oblique view subangulate, not bilobous.
Minor: all of head and body foveolate and opaque; all of central strip of first gastral tergite and posterior central strip of second gastral tergite shagreened.
MEASUREMENTS (mm) Syntype major: HW 1.42 HL 1.42, SL 0.84, EL 0.20, PW 0.66.
Minor (Quetzaltepeque, El Salvador): HW 0.54, HL 0.60, SL 0.76, EL 0.12, PW 0.34.
COLOR Major and minor: varies among series from dark yellow to medium reddish brown.
RANGE I have confirmed series from El Salvador, Costa Rica, and Panama. J. T. Longino (1997) reports it from Honduras and the Pacific lowlands and slopes of Costa Rica to 1500 m.
BIOLOGY According to Longino (1997), *pugnax* is one of the most common ants of the Pacific lowlands of Costa Rica, where it thrives in disturbed habitats, second-growth forest vegetation, and open terrain generally. Nests are usually excavated in the soil, and, in one instance observed, beneath the loose bark of an understory tree. Workers forage over the ground and onto low vegetation.

Compare with *alpestris, accinota, cameroni*

FIGURE Upper: lectotype, major (scape missing from specimen). Lower: paralectotype, minor. BOLIVIA: Quiacca. Scale bars = 1 mm.

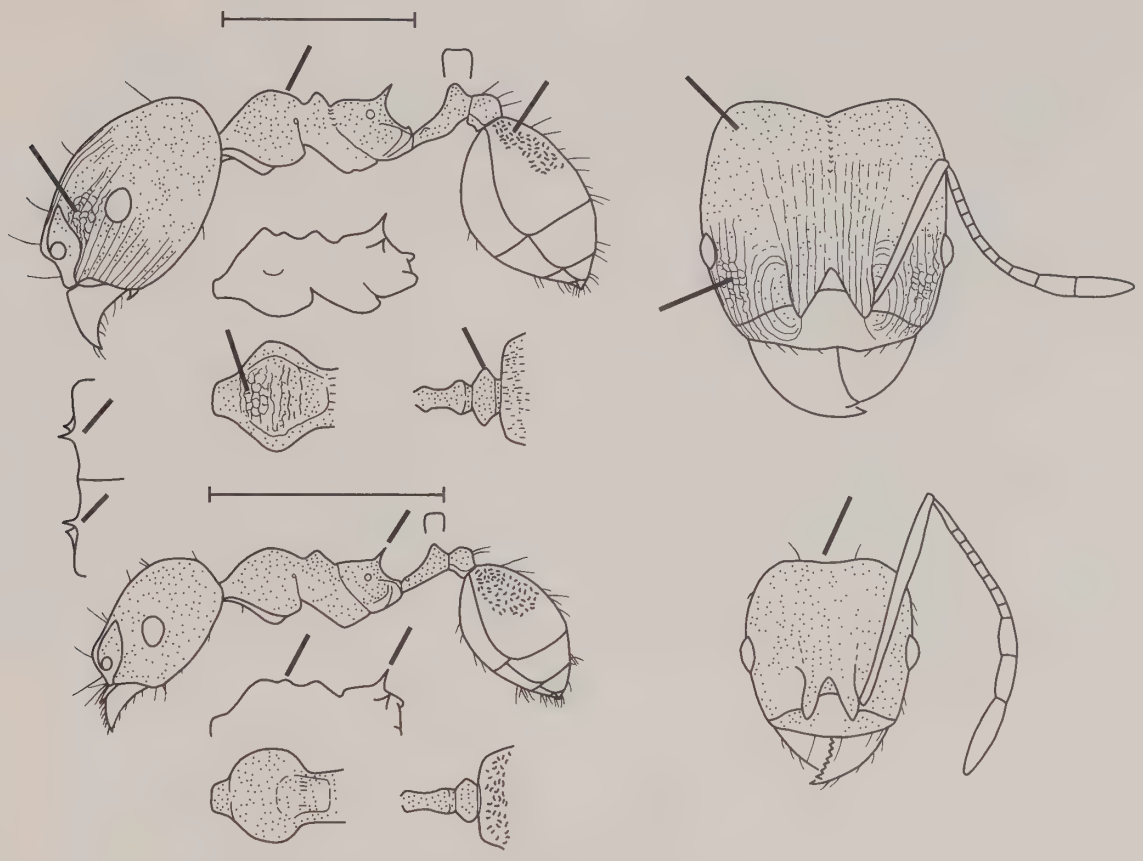


Pheidole quiaccana Wheeler

Pheidole quiaccana Wheeler 1925a: 13.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Name based on the type locality.
DIAGNOSIS A medium-sized, brown member of the *diligens* group characterized by the following combination of traits.
Major: small convexity present on middle of profile of propodeal basal face in dorsal-oblique view; mesonotal convexity low and metanotal depression shallow, giving the mesosoma a more cylindrical form in side view than is usual for *Pheidole*; pilosity of head sparse, but that of mesosoma and gaster dense, with some hairs unusually long; propodeal spine short; petiolar node trapezoidal.
Minor: small convexity present on middle of profile of propodeal basal face in side view; pilosity dense everywhere on body, with many hairs extremely long; propodeal spines reduced to denticles; occiput broad and lacking nuchal collar.
See also *alpestris, accinota,* and *cameroni*.
MEASUREMENTS (mm) Holotype major: HW 1.44 HL 1.44, SL (scape missing), EL 0.20, PW 0.68.
Paratype minor: HW 0.78, HL 0.84, SL 0.96, EL 0.14, PW 0.44.
COLOR Major: concolorous light reddish brown.
Minor: concolorous yellowish brown.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. FRENCH GUIANA: Cayenne (collected by M. Jelski). Scale bars = 1 mm.



Pheidole radoszkowskii Mayr

Pheidole radoszkowskii Mayr 1884: 35. Syn.: *Pheidole radoszkowskii* race *australis* Emery 1890c: 50, n. syn.; *Pheidole radoszkowskii* var. *luteola* Forel 1893j: 406, n. syn.; *Pheidole radoszkowskii* var. *acuta* Emery 1894d: 154, n. syn.; *Pheidole radoszkowskii* var. *opacissima* Forel 1901j: 364, n. syn.; *Pheidole radoszkowskii* var. *parvinoda* Forel 1912g: 223, n. syn.; *Pheidole triconstricta* var. *paranana* Santschi 1925b: 13, n. syn.; *Pheidole radoszkowskii* var. *reflexans* Santschi 1933f: 109, n. syn. *Pheidole radoszkowskii* var. *saviozae* Forel 1911e: 304 and *Pheidole radoszkowskii* var. *discursans* Forel 1912g: 223 are junior synonyms of *Pheidole triconstricta* Forel (q.v.). The types of *Pheidole radoszkowskii* var. *semilaevis* Forel 1901j: 368 could not be located in the Forel collection, and their status remains unknown. *Pheidole radoszkowskii parvinoda* var. *erubens* Forel 1912g: 224 is an unavailable name due to the ineligibility of quadrinomials. Raised to species level in this monograph: *geraesensis, inversa*.

TYPES Naturhist. Mus. Wien.

ETYMOLOGY Named after O. Radoszkowsky, author of a list of the ants of Cayenne, French Guiana.

DIAGNOSIS A widespread abundant species of the *diligens* group characterized by the following combination of traits.

Major: reddish brown; pilosity sparse, entirely absent from mesosoma; patches of rugoreticulum present mesad to the eyes and anterior half of the pronotal dorsum; longitudinal carinulae cover the frontal lobes and extend most of the way posteriorly to the occiput; all of head, mesosoma, and waist foveolate and opaque; part of first gastral tergite shagreened and opaque; promesonotal profile 3-lobed in dorsal-oblique view.

Minor: reddish brown; carinulae absent or nearly so from body, including dorsum of head; all of head, mesosoma, and waist foveolate and opaque; part of first gastral tergite shagreened and opaque, remainder of gaster smooth and shiny.

P. radoszkowskii as conceived by me is highly variable, and may contain sibling species in addition to named infraspecific forms. (I have split off var. *inversa* and subsp. *pugnax*.) The synonymy I propose must therefore be considered provisional. In particular, there is wide variation among nest series in body color, from light to dark reddish brown. The form of the inner pair of hypostomal teeth ranges from long spikes to small denticles that do not reach beyond the hypostomal border; this variation may be bimodal. The amount of shagreening and hence degree of opacity differs from place to place and colony to colony. The extent of the rugoreticular patches also varies considerably. There is, finally, substantial variation in the thickness of the propodeal spine and petiolar node; for example, in the types of "variety *acuta*" these parts are noticeably thinner, and in "race *australis*" they are thicker. Only studies of geographical and local variation will resolve the question of the nature of this variation and the possible existence of a sibling-species complex. Meanwhile, I have chosen the conservative measure of recognizing a single, widespread species. Otherwise, *radoszkowskii* can be separated from the three species it most resembles, *diligens, inversa,* and *pugnax* by the following combination of traits in the **major**:

occiput foveolate and opaque; rugoreticulum present mesad to each eye; dorsum of promesonotum devoid of all pilosity; pronotum carinulate or rugoreticulate; anterior third to two-thirds of median strip of first gastral tergite shagreened; color usually reddish brown; 4 teeth present on hypostoma.

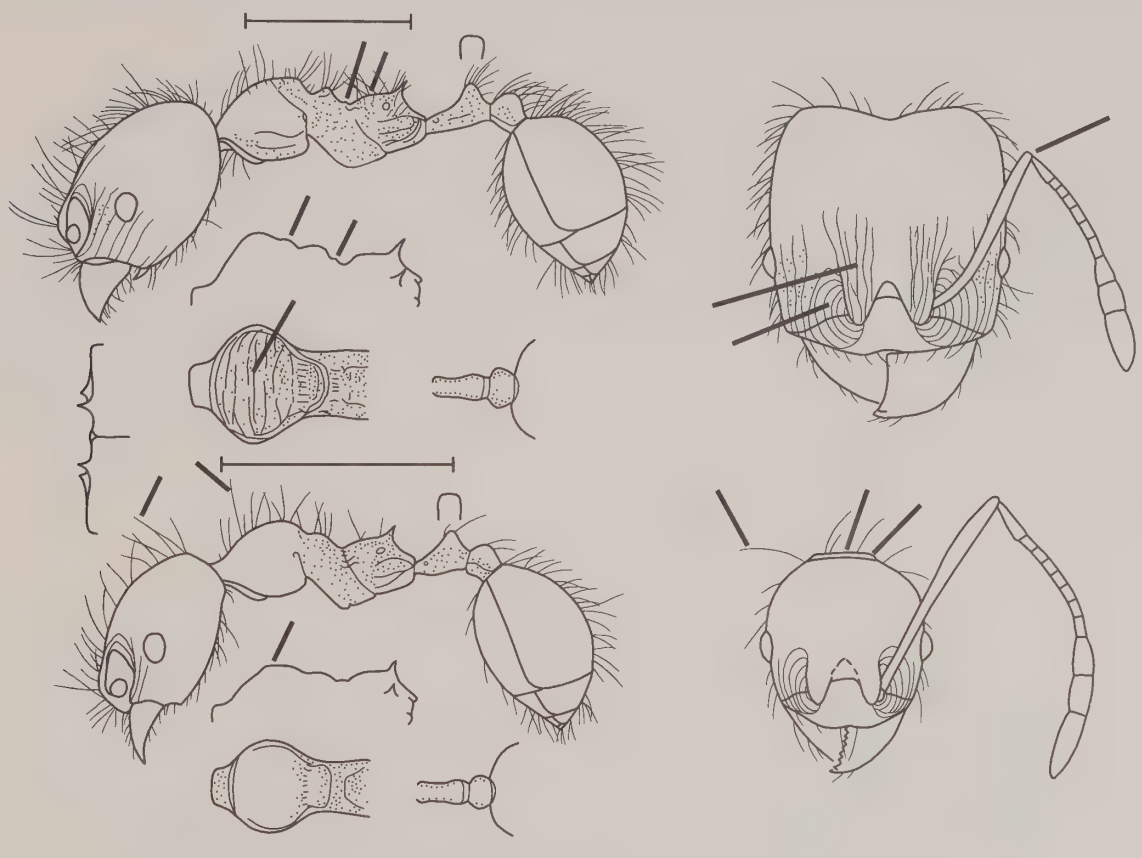
MEASUREMENTS (mm) Lectotype major: HW 1.08 HL 1.08, SL 0.72, EL 0.20, PW 0.54.
Paralectotype minor: HW 0.54, HL 0.60, SL 0.66, EL 0.14, PW 0.34.

COLOR Major: body and mandibles medium reddish brown, antennae and legs brownish yellow.
Minor: body very dark, almost blackish brown, with a slight tinge of red; appendages medium brown.
Other series placed in this species range from light to dark reddish brown.

RANGE As presently conceived as one species, *radoszkowskii* ranges very widely through the New World tropics, from Jamaica, parts of the Lesser Antilles, and Central America south to Bolivia and to Argentina as far as Tucumán. It may prove to be a complex of sibling species, as noted in the Diagnosis (above).

BIOLOGY *P. radoszkowskii* prefers relatively open, dry habitats and does especially well in places modified by human activity. I collected it from along a hotel seawall on Tobago. On St. Vincent, H. H. Smith (cited by Forel 1893j, who described the accessions as "variety *luteola*") found it common in open environments from sea level to the edge of the Soufrière Volcano at about 900 meters. Nests on St. Vincent, Smith noted, are usually in the soil beneath a stone or piece of wood in open ground, less commonly within pieces of rotting wood or in rubbish. When beneath an object, the nest is composed of a vertical chamber 8–12 mm wide that branches downward a half dozen cm or so and ends in small chambers 2–3 cm wide. Colonies grow to contain two or three thousand workers, about one-fifth of which are majors. There is apparently only a single fertile queen. In Costa Rica, Longino (1997) found "variety *luteola*" in similar habitats to those reported by Smith on St. Vincent, nesting beneath dead wood on the ground. Workers forage during the day over the ground and on low vegetation. On Tobago I found they could be recruited in large numbers with baits. Studying the species in Costa Rica, Roberts and Heithaus (1986) observed workers collecting seeds and thus helping to spread the seed shadow of *Ficus hondurensis*; the ants removed the seeds either directly from fallen fruit or from the feces of frugivorous lizards, birds, and mammals. Winged queens and males of *radoszkowskii* were found in the Cumberland Valley of St. Vincent in mid-October.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Rio de Janeiro. Scale bars = 1 mm.



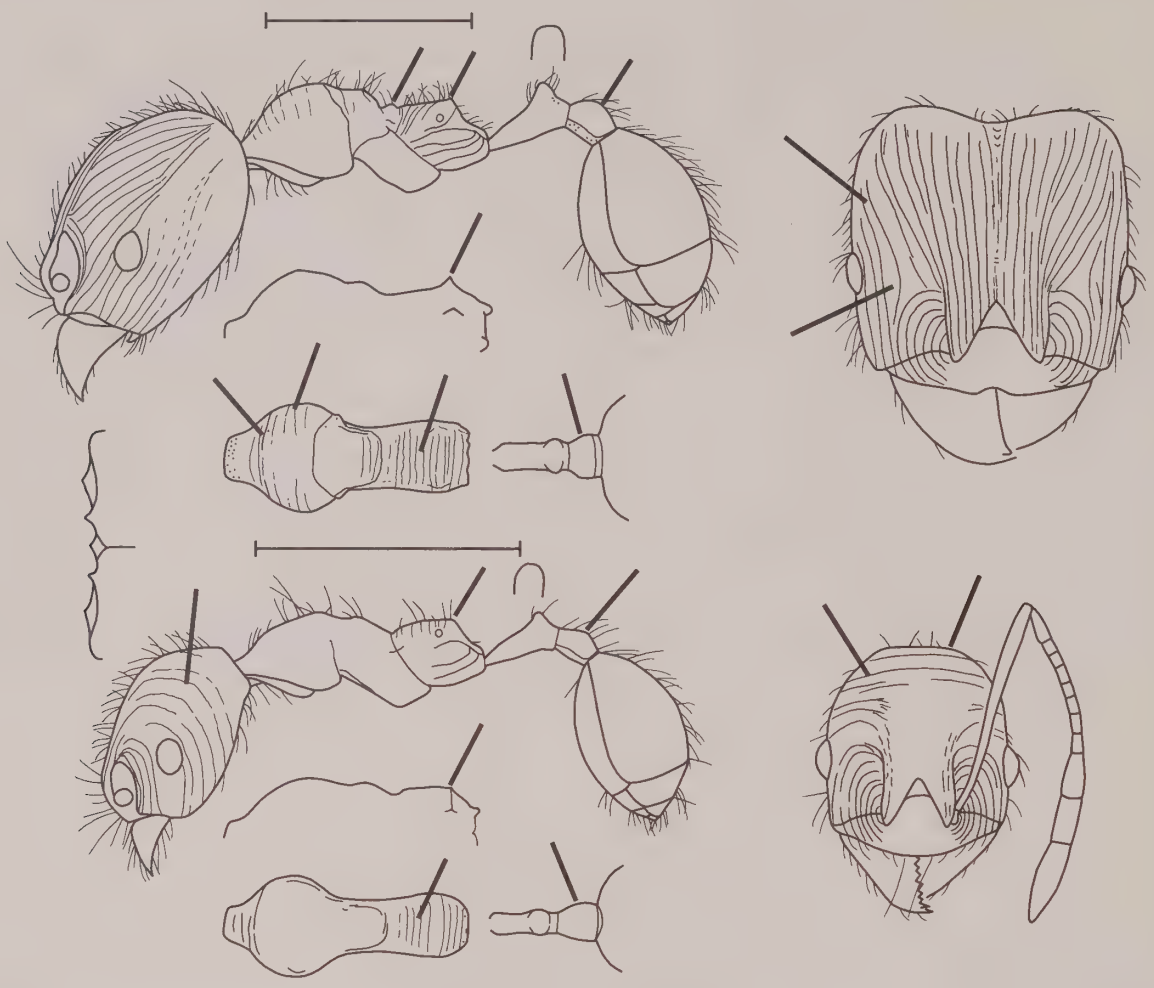
Pheidole reichenspergeri Santschi

Pheidole reichenspergeri Santschi 1923d: 49.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY Eponymous.
DIAGNOSIS A member of the *diligens* group resembling in different traits the species listed in the heading above, and differing by the following combination of traits.
Major: antennal scape fails to reach the occipital corner by its own maximum width; a small convexity present on the metanotum; pilosity dense and very long, some of the hairs 2× the Eye Length; pronotum completely covered by transverse carinulae and foveolate; rugoreticulum absent on head; carinulae originating on frontal lobes reach posteriorly well beyond the level of the eye.
Minor: pilosity extremely long, with some of the hairs more than 2× the Eye Length; humerus feebly subangulate in dorsal-oblique view; occiput with nuchal crest.
MEASUREMENTS (mm) Lectotype major: HW 1.14, HL 1.22, SL 0.88, EL 0.22, PW 0.64.
Paralectotype minor: HW 0.62, HL 0.74, SL 0.84, EL 0.14, PW 0.40.
COLOR Major and minor: light reddish brown, appendages brownish yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *alfaroi, diana, laelaps, seligmanni, tepuicola*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ECUADOR: El Angel, near Tulcán, north-central Ecuador, 3000 m (P. Rivet). Scale bars = 1 mm.

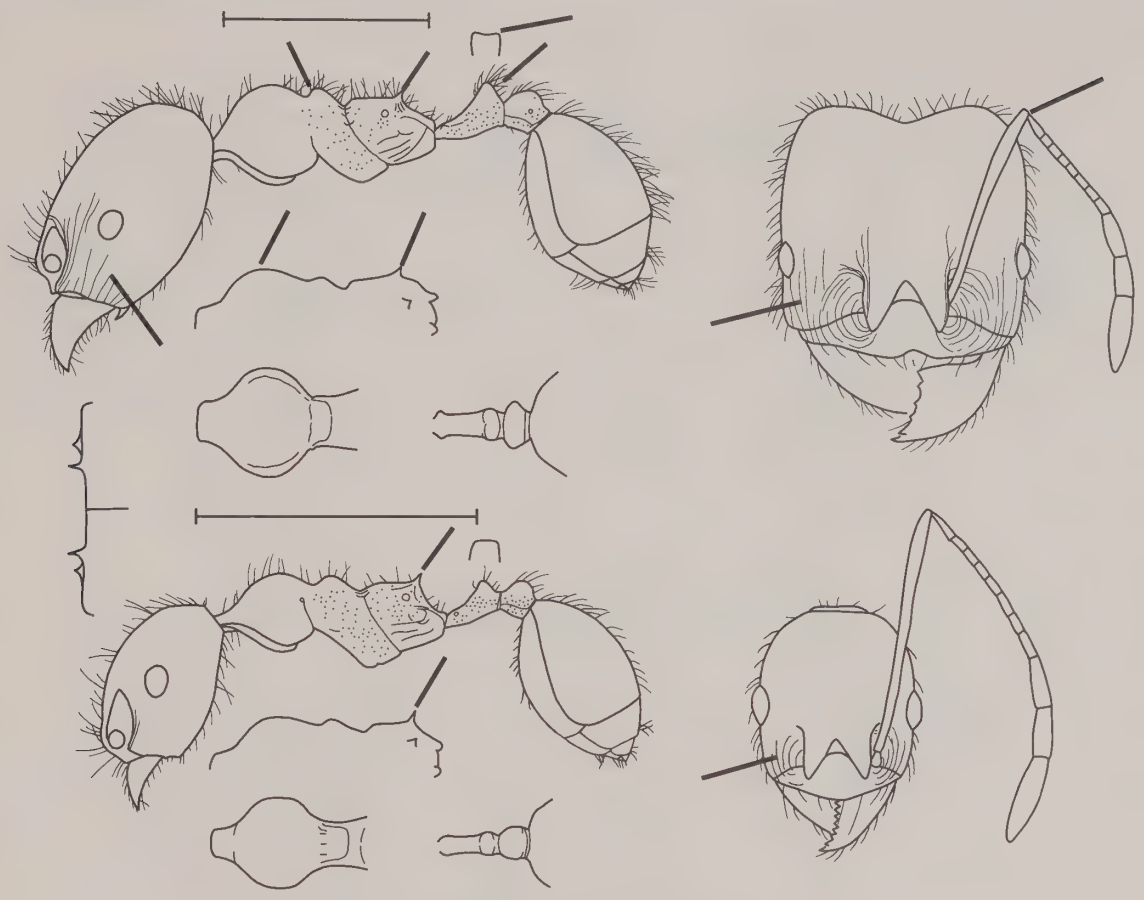


Pheidole riveti Santschi

Pheidole riveti Santschi 1911i: 278.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY Named after the collector, P. Rivet.
DIAGNOSIS Similar in various ways to the species listed in the heading above, distinguished as follows.
Major: propodeal spine reduced to obtuse angle in side view, right angle in dorsal-oblique view; postpetiolar node in side view suppressed, in dorsal view narrow and bell-shaped; occipital margin smooth; carinulae originating on frontal lobes spread laterally as they approach occipital margin; propodeal dorsum and margins of promesonotal dorsum transversely carinulate.
Minor: head "tiger-striped" with semicircular carinulae, as depicted; propodeal dorsum transversely carinulate; occiput narrow but lacks nuchal collar; postpetiolar node in side view suppressed and entire postpetiole cylindrical.
MEASUREMENTS (mm) Lectotype major: HW 1.12, HL 1.16, SL (scapes missing), EL 0.14, PW 0.54.
Paralectotype minor: HW 0.62, HL 0.76, SL 0.76, EL 0.14, PW 0.40.
COLOR Major: concolorous light brown.
Minor: concolorous medium brown.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Ceará. Scale bars = 1 mm.



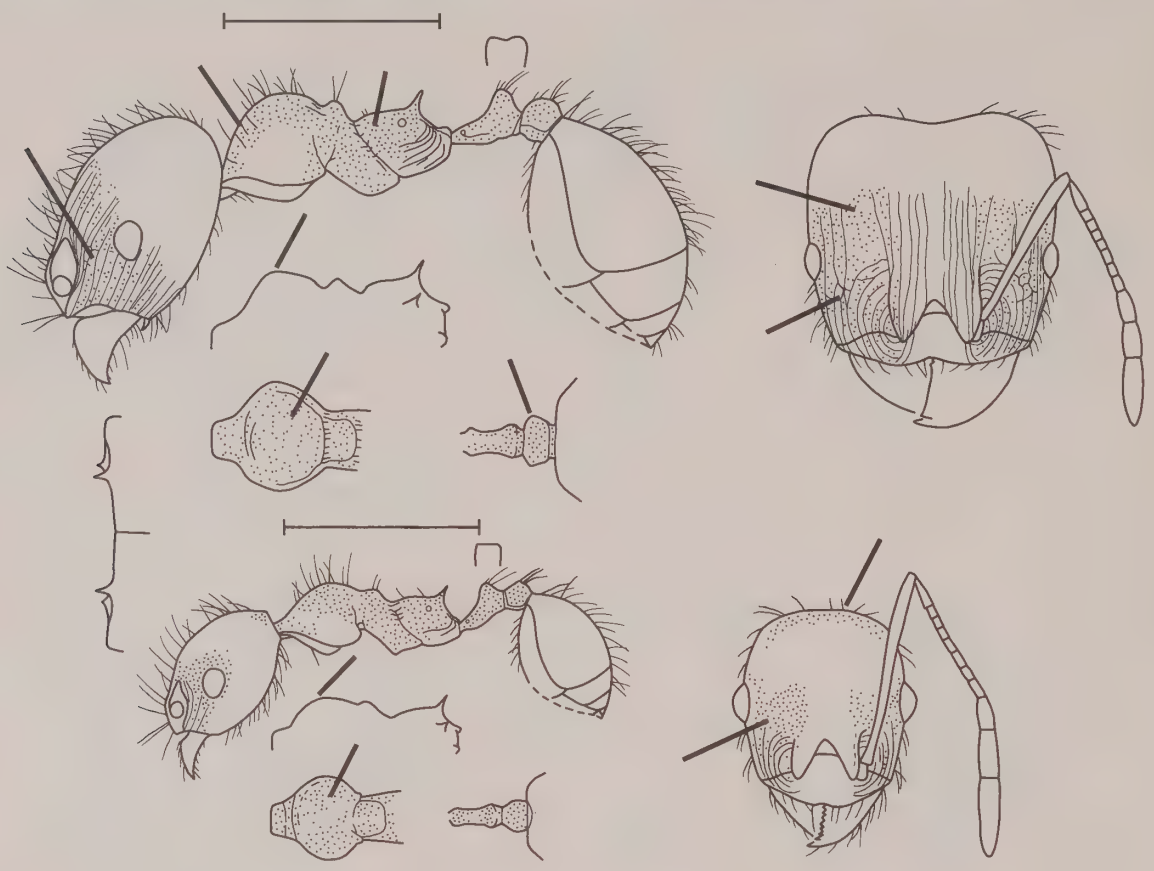
Pheidole rochai Forel, **new status**

Pheidole lemur r. *rochai* Forel 1912g: 226. *Pheidole lemur rochai* var. *deflexa* Santschi 1923d: 46 is a quadrinomial and unavailable.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY Eponymous.
DIAGNOSIS A small yellow member of the *diligens* group whose **major** has a moderately prominent mesonotal convexity as part of a bilobous promesonotal outline seen in dorsal-oblique view; short, equilaterally triangular propodeal spine; overall mostly smooth and shiny body with sculpturing on the head confined to the eye level and anterior to it, and composed exclusively of longitudinal carinulae; and abundant medium-length, erect pilosity.
Close to *blumenauensis, longiscapa, perryorum, tanyscapa,* and *vafra,* but differing variously in head shape, eye size, sculpturing, and color. See also the less similar *lemur, pubiventris, seeldrayersi,* and *variegata,* as illustrated.
MEASUREMENTS (mm) Lectotype major: HW 0.92, HL 0.96, SL 0.76, EL 0.14, PW 0.56.
Paralectotype minor: HW 0.50, HL 0.60, SL 0.74, EL 0.12, PW 0.34.
COLOR Major and minor: concolorous yellow.
RANGE Known with certainty only from the Ceará type series. I have not seen the series described by Santschi (1923d: 46) as "var. *deflexa*" from Paraguay.
BIOLOGY Unknown.

Compare with *coffeicola, laevifrons, laevinota, pubiventris, variegata*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Ipiranga, São Paulo. Scale bars = 1 mm.

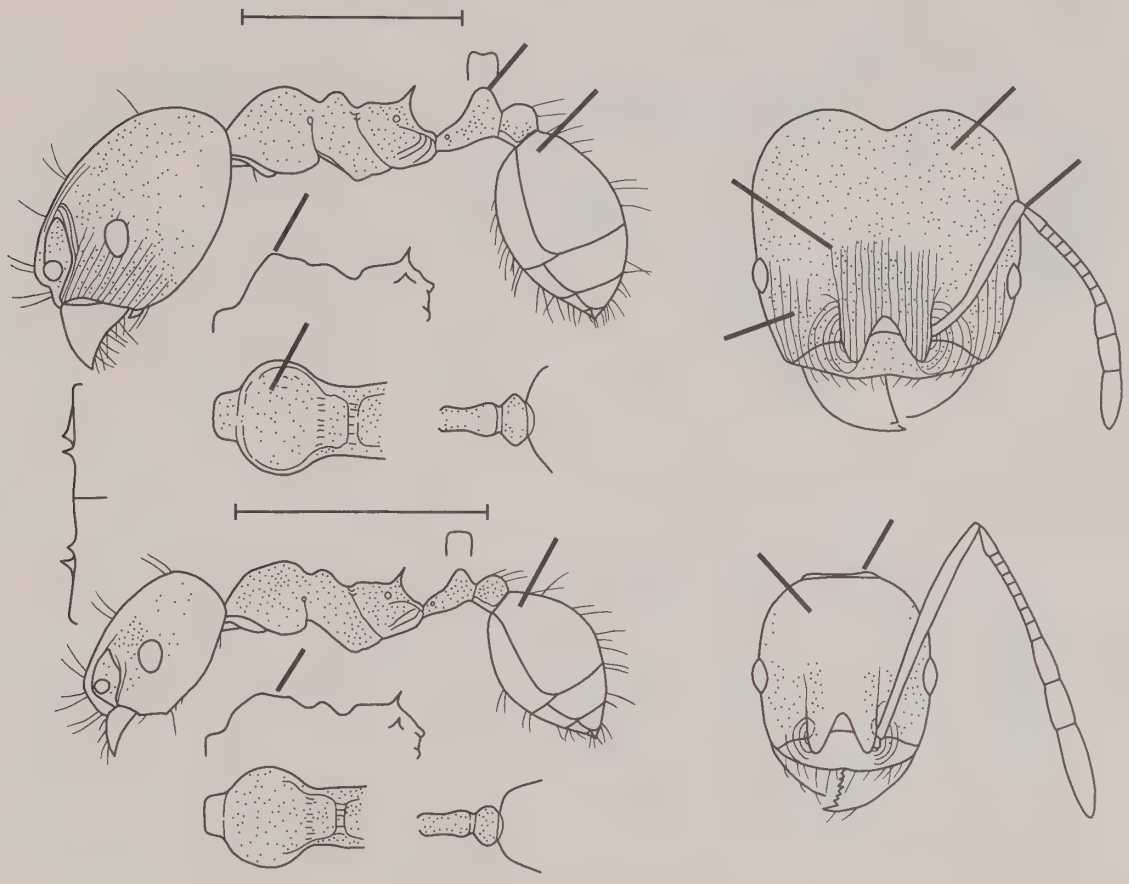


Pheidole rufipilis Forel

Pheidole rufipilis Forel 1908h: 371. Syn.: *Pheidole rufipilis* var. *divexa* Forel 1908h: 372, n. syn.; *Pheidole pubiventris* st. *impia* Santschi 1923d: 46, n. syn. Raised to species level in this monograph: infraspecific forms *dione* (*fallax* group), *industa* (*fallax* group), *laevinota* (*diligens* group).

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY L Gr *rufipilis,* red hair.
DIAGNOSIS Similar to species listed in heading, but especially to *laevinota,* a partially sympatric species from which it differs as follows.
Major: patch of rugoreticulum located near middle of outer margin of antennal fossa; at most, sparse carinulae occur along anterior margin of pronotum; entire dorsal surface of promesonotum foveolate and opaque; upper half of propodeal side foveolate but not carinulate; postpetiole trapezoidal from above, with angulate sides; humerus in dorsal-oblique view rounded.
Minor: humerus in dorsal-oblique view rounded; entire promesonotum foveolate.
MEASUREMENTS (mm) Lectotype major: HW 1.12, HL 1.14, SL 0.80, EL 0.22, PW 0.58.
Paralectotype minor: HW 0.64, HL 0.70, SL 0.70, EL 0.18, PW 0.40.
COLOR Major: not recorded.
Minor: body concolorous brown, appendages a slightly contrasting yellowish brown; hair pale yellow.
RANGE São Paulo and *("pubiventris* st. *impia")* Minas Gerais, Brazil.
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: 5 km north of Villavicencio, Meta (William L. and Doris E. Brown). Scale bars = 1 mm.

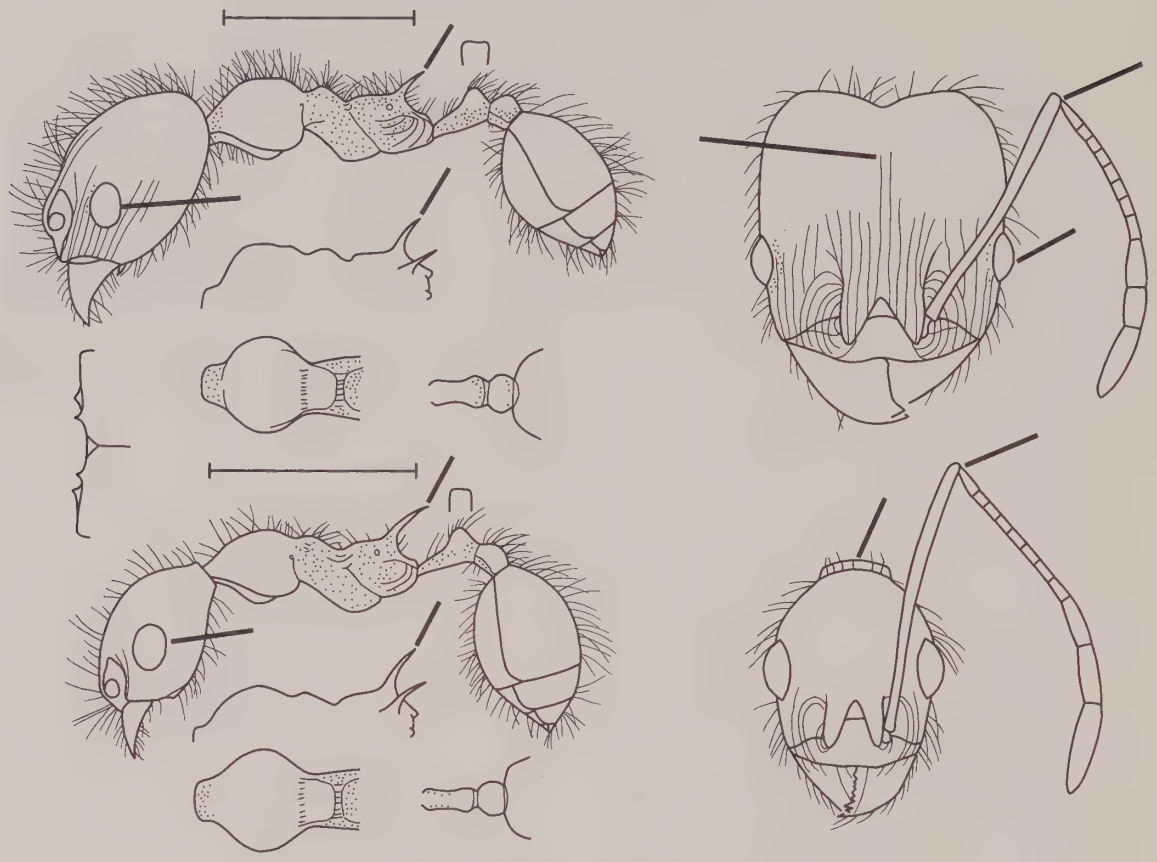


Pheidole sagax **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *sagax,* referring to the globose occipital lobes.
DIAGNOSIS A member of the *diligens* group, close to *diligens, radoszkowskii,* and allied species, distinguished as follows.
Major: yellow; in full-face view, profiles of occipital lobes form almost perfect semicircles; in dorsal-oblique view, humerus is subangulate and pronotum weakly bilobous; petiolar node broad, its apex in side view broadly rounded; all of head dorsum and mesosoma foveolate; gaster entirely smooth and shiny; profile of head in full-face view bare of pilosity, except for clypeus.
Minor: yellow; occiput slightly narrowed, with nuchal collar; most of posterior dorsal surface of head and all of gaster smooth and shiny.
MEASUREMENTS (mm) Holotype major: HW 1.14, HL 1.14, SL 0.76, EL 0.16, PW 0.54.
Paratype minor: HW 0.54, HL 0.62, SL 0.70, EL 0.14, PW 0.36.
COLOR Major and minor: concolorous medium yellow.
RANGE Known from the type series and form Granada, Nicaragua (C. F. Baker).
BIOLOGY The type series was collected from a forested ravine.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Estácion Biologica de Cocha Cashu, Madre de Dios, 400 m (Diane W. Davidson). Scale bars = 1 mm.



Pheidole scimitara **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Pers *scimitara,* a curved sword, referring to the propodeal spines.

DIAGNOSIS A very distinctive member of the *diligens* group, somewhat similar to *calimana, cataractae, demeter, machetula, sicaria,* and *tenuis,* distinguished in both **major** and **minor** by the very long propodeal spines and extremely large eyes. Also, the antennal scape of the **major** exceeds the occipital corner by more than its own maximum width, and the **minor** has a narrowed occiput with nuchal collar.

MEASUREMENTS (mm) Holotype major: HW 1.00, HL 1.10, SL 1.00, EL 0.24, PW 0.54.
Paratype minor: HW 0.54, HL 0.74, SL 0.98, EL 0.22, PW 0.40.

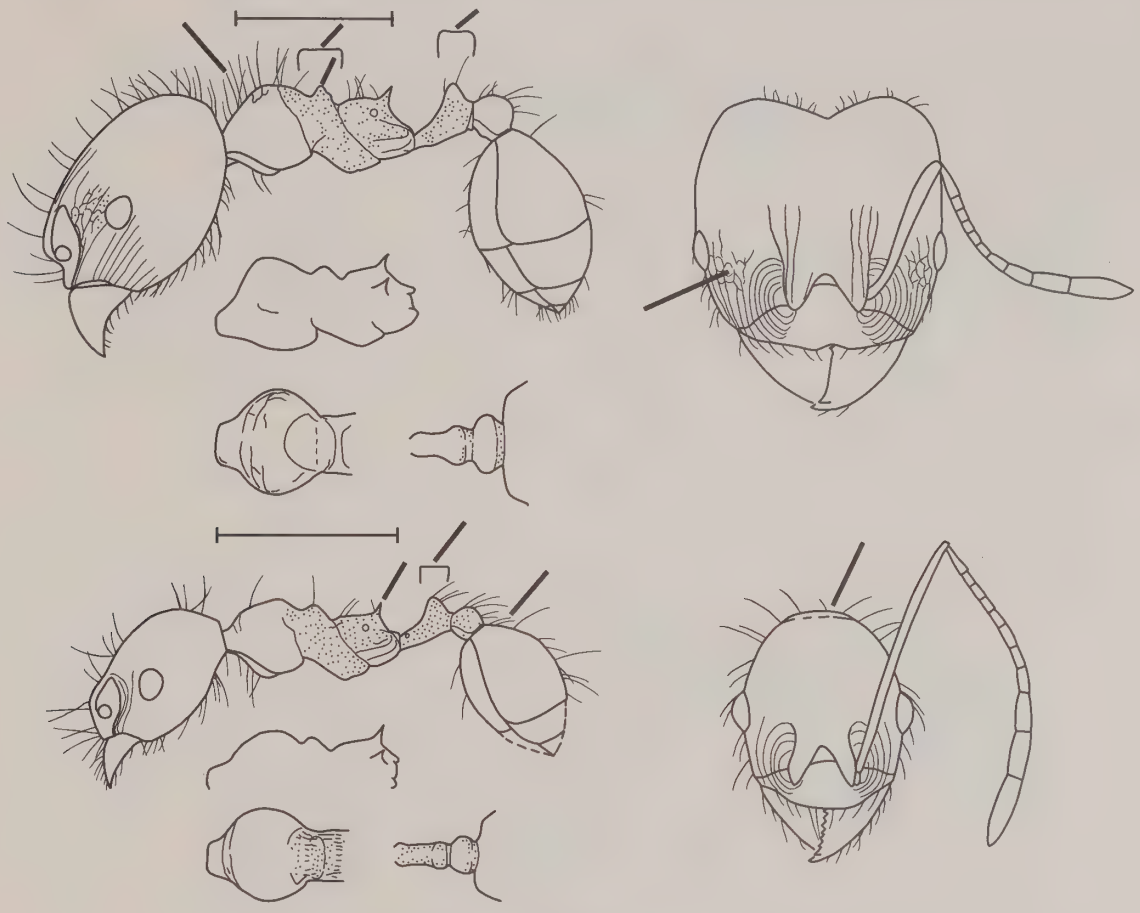
COLOR Major: head and mandibles medium to dark reddish brown; rest of body and appendages light yellowish brown
Minor: head and gaster light yellowish brown; mesosoma, waist, and appendages yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

Compare with *coffeicola, laevifrons, laevinota, pubiventris, rufipilis, variegata*

FIGURE Upper: lectotype, major, including views from rear of both mesonotal convexity and petiolar node. Lower: paralectotype, minor. COLOMBIA: no further locality. Scale bars = 1 mm.



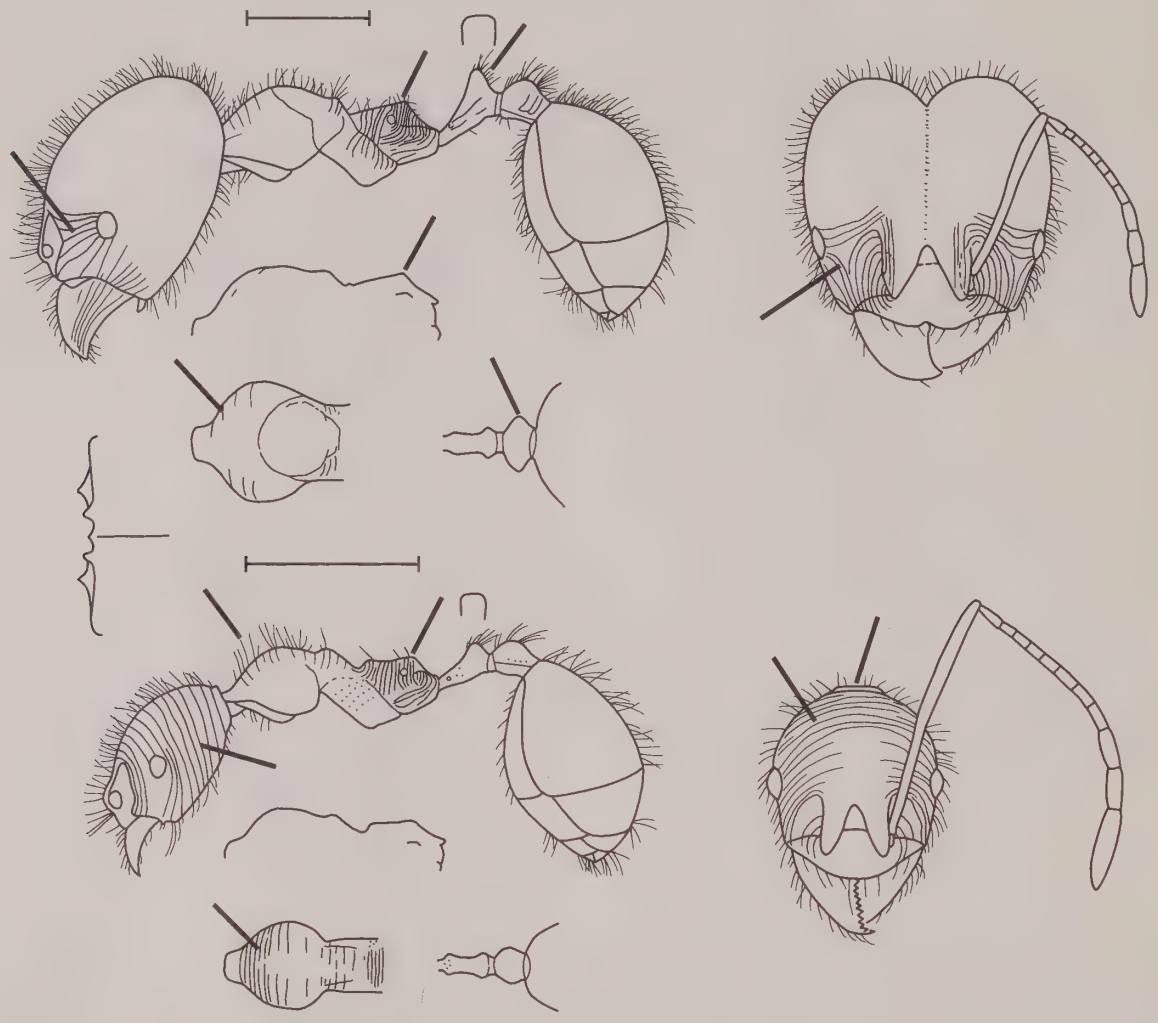
Pheidole seeldrayersi Forel

Pheidole seeldrayersi Forel 1910a: 30.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY Eponymous.
DIAGNOSIS A medium-sized, yellowish brown member of the *diligens* group with long, erect pilosity, close to *coffeicola* and *variegata,* differing, as figured, in the major class by its shorter scapes, denser pilosity, triangular and pointed mesonotal convexity in side view, and more extensive cephalic rugoreticulum, which rugoreticulum stretches from the eyes to the circular carinulae surrounding the antennal fossae. See also the less similar *laevifrons, laevinota, pubiventris,* and *rufipilis*.
MEASUREMENTS (mm) Lectotype major: HW 1.28, HL 1.28, SL 0.88, EL 0.20, PW 0.64.
Paralectotype minor: HW 0.64, HL 0.74, SL 0.96, EL 0.18, PW 0.44.
COLOR Major: body and appendages yellowish brown, with the gaster a darker shade.
Minor: concolorous yellowish brown.
RANGE Colombia, and one series from near Flor de Oro, Santa Cruz, Bolivia, 450 m (P. S. Ward). Kempf (1972b) reports the species from Catamarca, Argentina, a surprising record that needs to be confirmed.
BIOLOGY Unknown.

Compare with *alfaroi, diana, laelaps, riveti, tepuicola*

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Parque Nacional Cuevas de los Guacharos, 10 km southeast of Palestina, Huila (Charles Kugler and J. Hahn). Scale bars = 1 mm.



Pheidole seligmanni **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY In honor of Peter A. Seligmann, for his signal contributions to conservation, from the creation of Conservation International to the protection of Neotropical forests and their faunas.

DIAGNOSIS A large member of the *diligens* group closest to *alfaroi, diana, laelaps, riveti,* and *tepuicola,* and somewhat less so to *laticornis* and *strigosa,* and distinguished from these and other species of *Pheidole* by the following combination of traits.

Major: carinulae originating on the inner surface of the eye travel laterally to the antennal fossa; propodeal spines absent, the basal and declivitous faces of the propodeum forming an obtuse angle; postpetiole from above diamond-shaped; lateral margins of pronotal dorsum, posterior half of mesopleuron, and all of propodeum carinulate; outer surfaces of middle and hind tibiae with abundant and conspicuous long, erect hairs.

Minor: all of posterior half of head covered by semicircular, "wraparound" carinulae; propodeal spines absent; nuchal collar present.

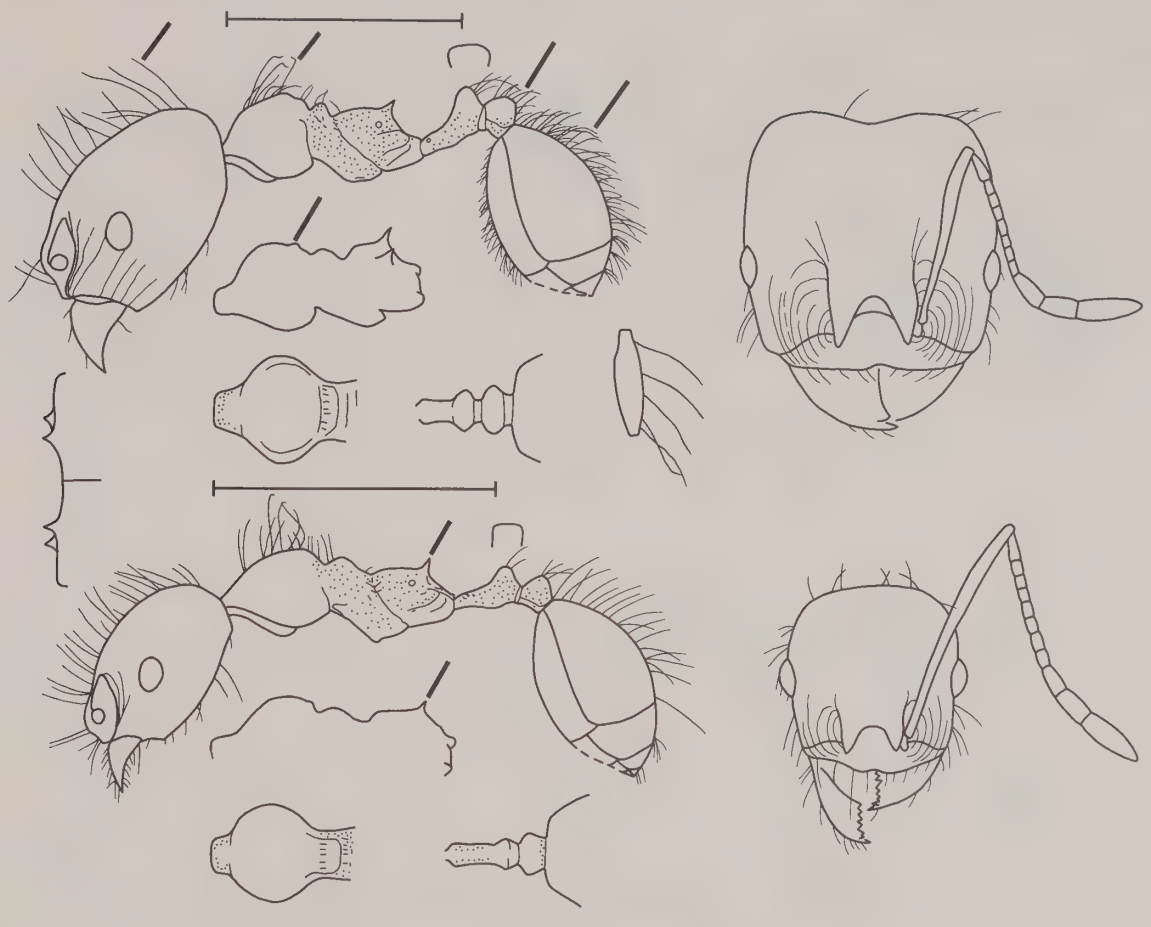
MEASUREMENTS (mm) Holotype major: HW 1.96, HL 1.96, SL 1.34, EL 0.24, PW 0.98.
Paratype minor: HW 0.76, HL 0.92, SL 1.16, EL 0.14, PW 0.52.

COLOR Major: body moistly medium yellow; anterior half of head deepening gradually to medium yellowish brown on the anterior rim of the clypeus and posteriorly on the first gastral segment.

RANGE Known only from the type locality.

BIOLOGY The type colony was collected under moss on a rotting log.

FIGURE Upper: holotype, major (tibia shown next to full-face view of head). Lower: paratype, minor. BRAZIL: Jacarepaguá (Taquera), Rio de Janeiro. Scale bars = 1 mm.



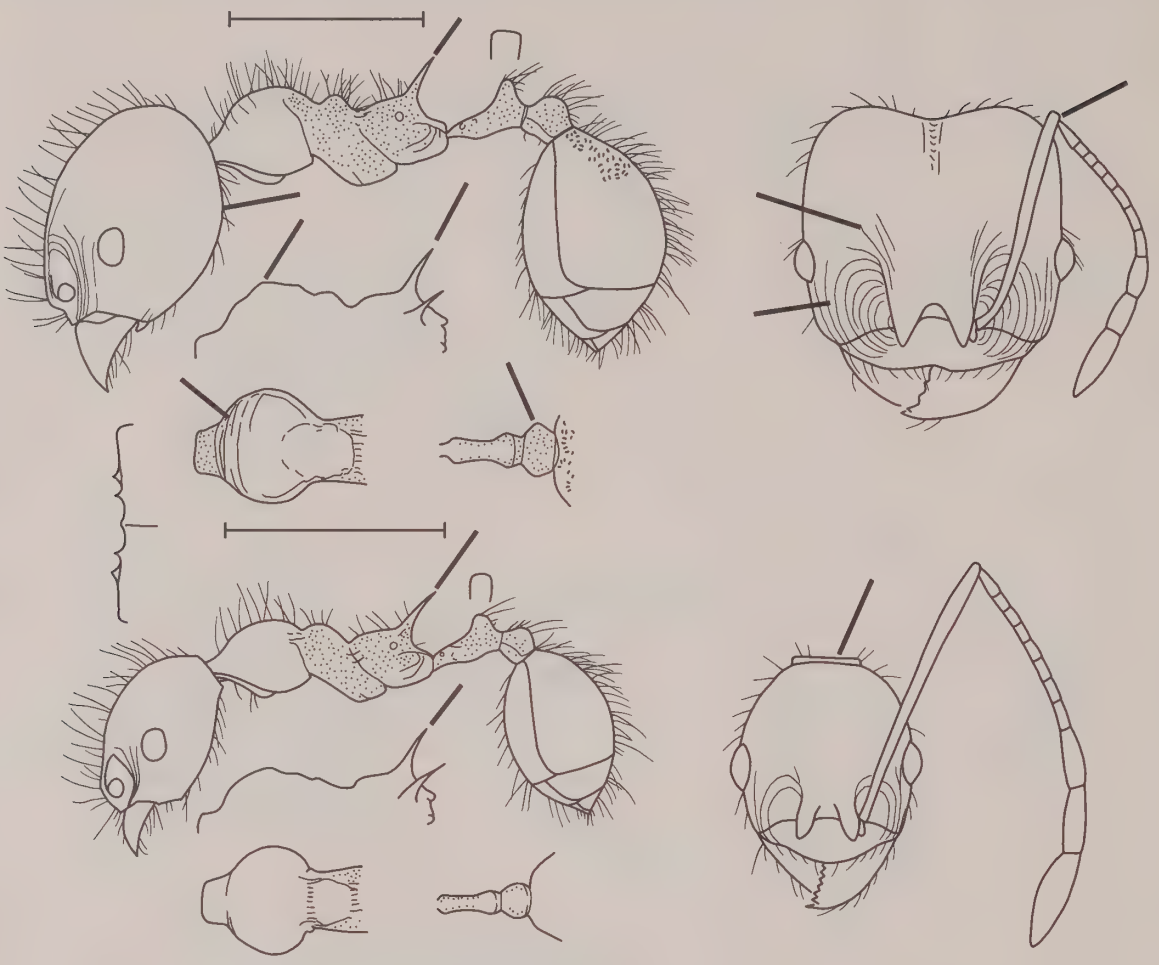
Pheidole sensitiva Borgmeier

Pheidole sensitiva Borgmeier 1959a: 316.

TYPES Mus. Zool. Univ. São Paulo.
ETYMOLOGY L *sensitiva,* possibly referring to the sensory function of the long body hairs.
DIAGNOSIS A small, light reddish brown member of the *diligens* group with moderately abundant to dense, very long, erect to semierect, often strongly curved hairs.
Major: sculpturing of head consists entirely of carinulae, which are limited to the anterior third of the head capsule and absent from the frontal lobes; promesonotal profile 3-lobed; pronotal humerus rounded in dorsal-oblique view; pilosity of gaster shorter and much denser than on the rest of the body.
Minor: humerus rounded and pronotum smooth and shiny.
Similar to *longiseta, pubiventris,* and *variegata,* differing in many details of body form and sculpturing, as shown.
See also *blumenauensis, rochai, seeldrayersi,* and *vafra*.
MEASUREMENTS (mm) Holotype major: HW 0.94, HL 0.94, SL 0.64, EL 0.16, PW 0.48.
Paratype minor: HW 0.58, HL 0.64, SL 0.76, EL 0.14, PW 0.38.
COLOR Major: light reddish brown; gaster a shade darker; appendages yellowish brown.
Minor: light brown, gaster a shade darker and appendages a shade lighter than head and mesosoma.
RANGE Known from the type series from Rio de Janeiro, a series from near San Juan de Arama, Meta, Colombia, and, according to Longino (1997), the Atlantic and Pacific slopes of Costa Rica to 700 m.
BIOLOGY In Costa Rica, Longino (1997) found the species in litter and recruiting to baits on the floor of rainforests.

Compare with *calimana, cataractae, demeter, machetula,* and especially *scimitara*

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Llorona, Corcovado National Park (Philip S. Ward). Scale bars = 1 mm.



Pheidole sicaria **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *sicaria,* with dagger, assassin.

DIAGNOSIS A member of the *diligens* group, most similar in habitus to *scimitara* of Peru, distinguished by the following traits.

Major: brown; antennal scape slightly exceeding occipital border; propodeal spine as long as the basal propodeal face; postpetiole from above laterally angulate; head capsule swollen, so that venter is strongly convex, and Head Width exceeds Head Length; humerus subangulate in dorsal-oblique view; anterior third of pronotal dorsum carinulate; head lacking rugoreticulum; anterior third of central strip of first gastral tergite shagreened.

Minor: propodeal spine as long as basal propodeal face; occiput narrowed, with nuchal collar.

MEASUREMENTS (mm) Holotype major: HW 1.20, HL 1.16, SL 1.04, EL 0.22, PW 0.60.
Paratype minor: HW 0.62, HL 0.72, SL 1.00, EL 0.14, PW 0.42.

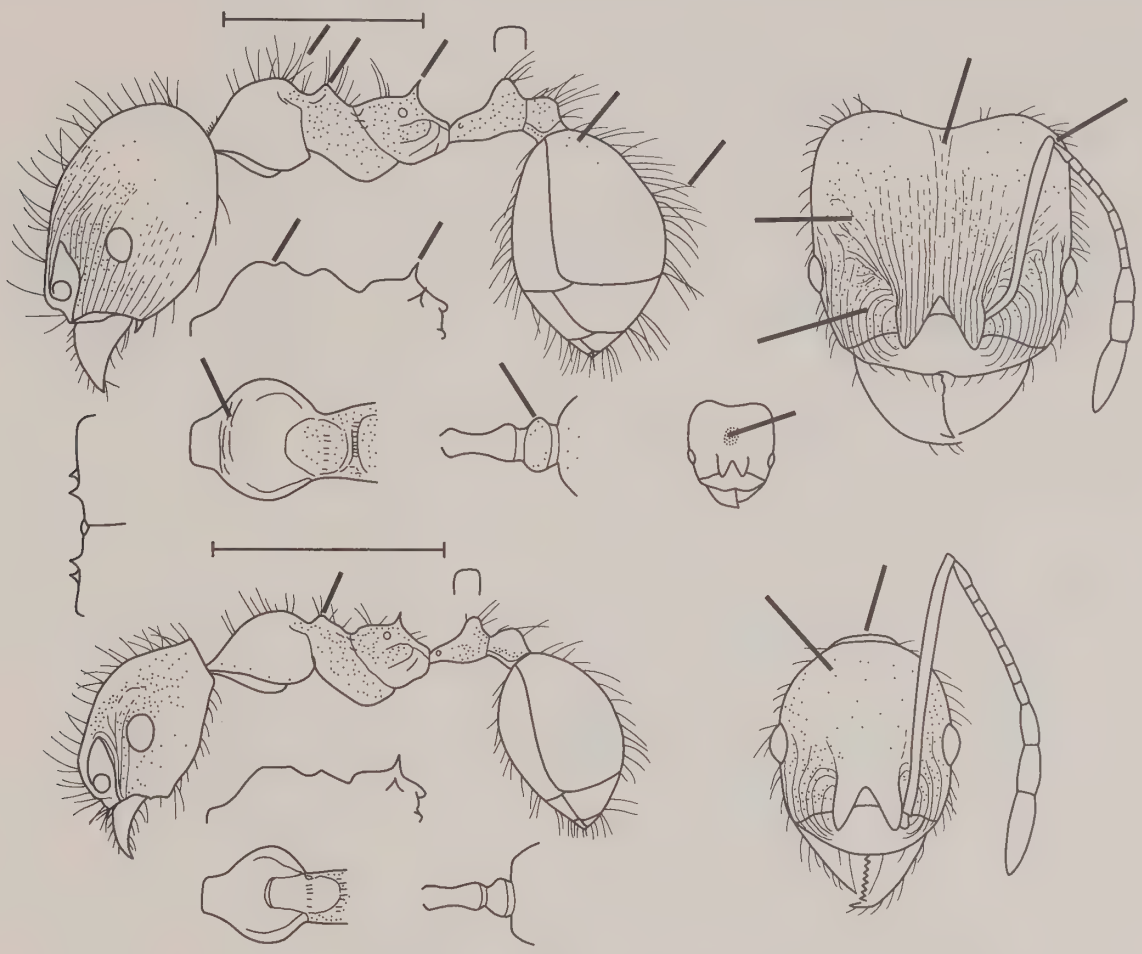
COLOR Major: body, mandibles, and scape medium brown; rest of appendages light to yellowish brown.
Minor: body light brown, appendages yellowish brown.

RANGE Mid-elevation, Atlantic slope; also upper elevation, to 700 m, Osa Peninsula of Costa Rica (J. T. Longino 1997).

BIOLOGY Known from mid-elevation rainforest and cloud forest. The types were collected by P. S. Ward on a palm trunk. Longino (1997) found two nests respectively in a clump of aroid roots and in loose dead leaves and fragments of carton lodged on the branch of a small *Ocotea* tree, whose hollow stems harbored a colony of *Myrmelachista*.

Compare with *coffeicola, gagates, hoelldobleri, mooreorum, peregrina, venatrix, zelata*

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Las Salinas, near Restrepo, Meta (W. W. Lamar). Scale bars = 1 mm.



Pheidole spilota **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *spilota,* spotted, stained, with reference to spot on vertex.

DIAGNOSIS A member of the *diligens* group similar in various characters to the species listed in the heading above, distinguished as follows.

Major: head yellowish brown with a light brown spot on vertex; antennal scape fails to reach occipital corner by about its own maximum width; mesonotal convexity angulate in side view; propodeal spine stout and a third as long as the basal propodeal face; no rugoreticulum on head; carinulae along frontal carinae spread strongly outward, and those next to dorsal midline reach the occiput; anterior median strip of first gastral tergite lightly shagreened; body densely covered with hairs as long as the eyes or longer.

Minor: yellow; occiput narrowed, with nuchal crest; posterior dorsal head surface sparsely foveolate; mesonotal convexity in side view subangulate.

MEASUREMENTS (mm) Holotype major: HW 1.16, HL 1.18, SL 0.96, EL 0.20, PW 0.56.
Paratype minor: HW 0.60, HL 0.76, SL 0.92, EL 0.14, PW 0.40.

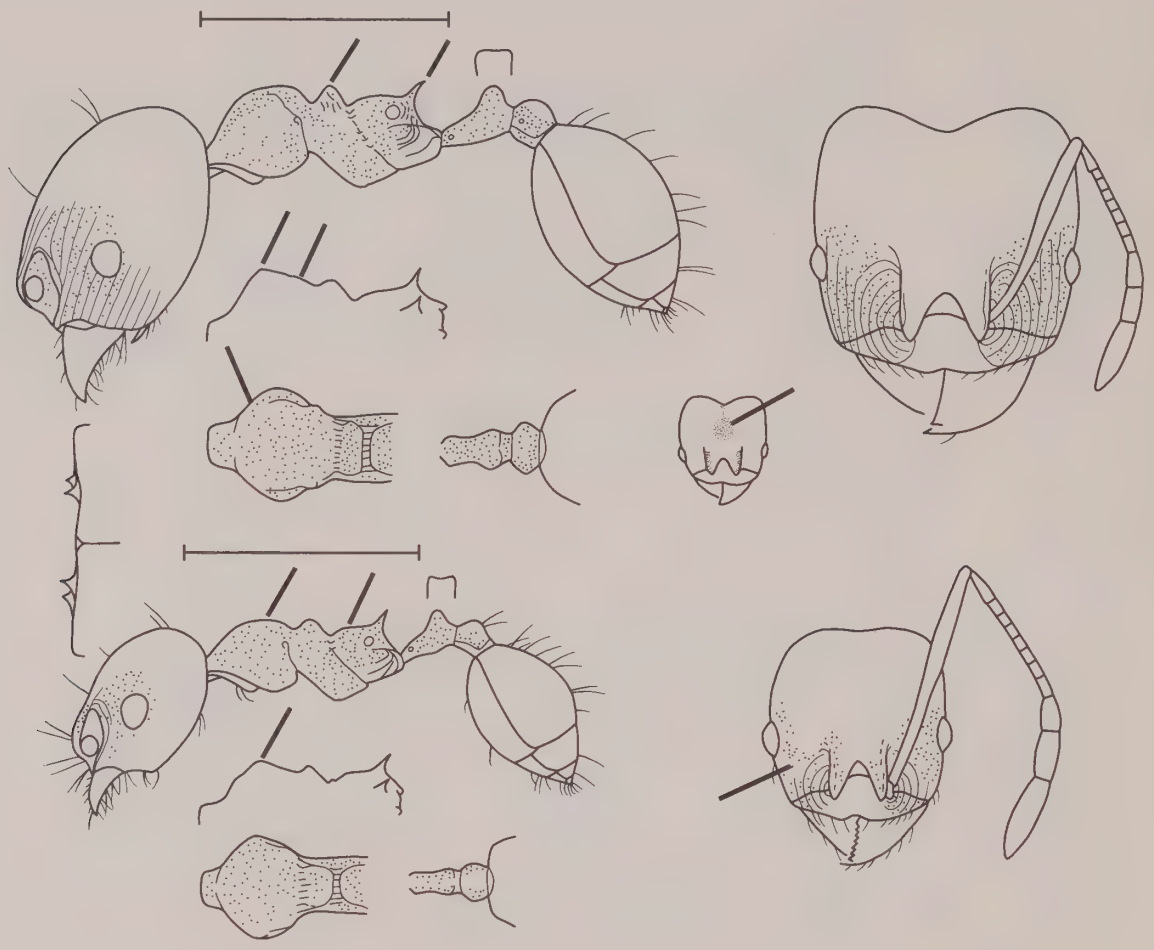
COLOR Major: concolorous yellowish brown, with a slightly contrasting small light brown spot on vertex; also, posterior strips of gastral tergites light brown.
Minor: concolorous dark yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. ECUADOR: Baños, near Riobamba, 1800 m (Gary J. Umphrey). Scale bars = 1 mm.



Pheidole stigma **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *stigma,* mark, spot, with reference to the dark spot on the head of the major.

DIAGNOSIS Distinguished within the *diligens* group by the following combination of traits.

Major: pilosity very sparse, generally, and entirely absent on the mesosoma and waist; head light reddish brown with medium brown spot on vertex and medium brown trim on margins of frontal lobes, as illustrated; carinulae limited to anterior half of head, including margins of frontal lobe, and posterior half of dorsal surface of head and all of gaster smooth and shiny; all of mesosoma and waist foveolate and opaque.

Minor: mesosoma devoid of hair; carinulae limited to circular carinulae around antennal fossae; all of mesosoma and petiole, as well as anterior half of head and side of postpetiole, foveolate and opaque, and the rest of the body smooth and shiny; body medium reddish brown, appendages light reddish brown, tarsi yellow.

Compare with *anima, bruesi, diligens, gagates, geraesensis, nubila, piceonigra, radoszkowskii,* and *triconstricta*.

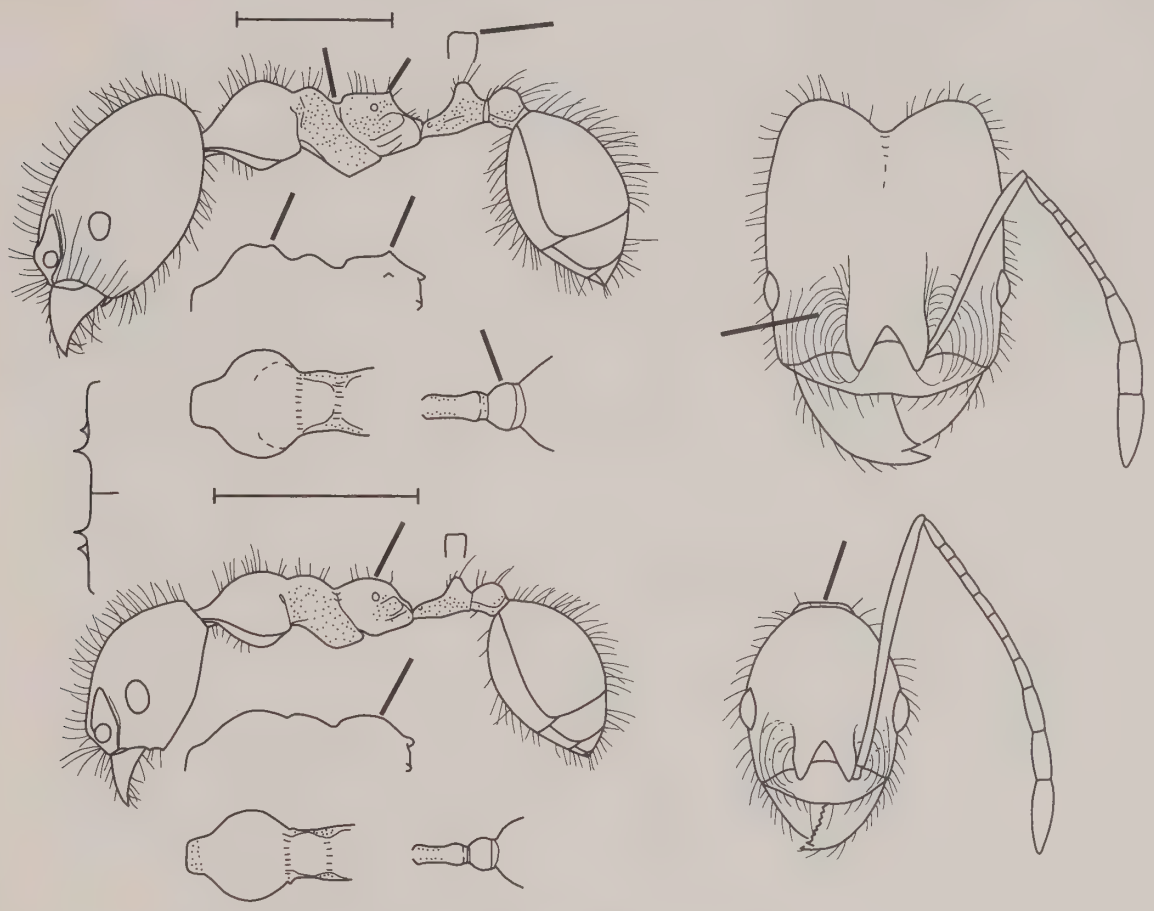
MEASUREMENTS (mm) Holotype major: HW 0.60, HL 0.64, SL 0.76, EL 0.14, PW 0.40.
Paratype minor: HW 1.00, HL 1.00, SL 0.80, EL 0.18, PW 0.52.

COLOR See in Diagnosis above.

RANGE Known only from the type locality.

BIOLOGY The type colony was found beneath a rock in a pasture.

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: Taperinha Santarém, Pará, 2°54′S 54°20′W (Robert L. Jeanne). Scale bars = 1 mm.

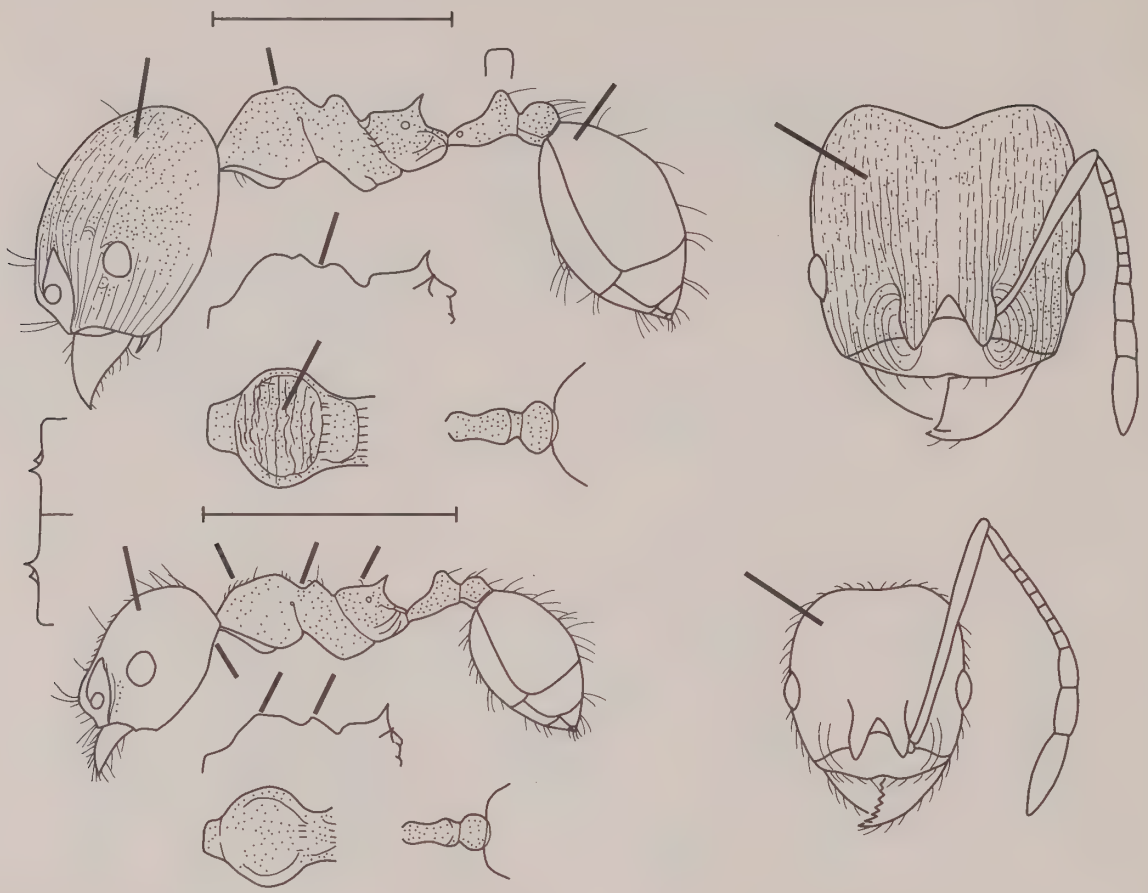


Pheidole strigosa **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *strigosa,* thin, lean.
DIAGNOSIS A member of the *diligens* group similar to *alfaroi, laticornis,* and *seligmanni,* distinguished from these and other *diligens* group species by the following combination of traits.
Major: head elongate, with deeply convex occipital border seen in full-face view; pronotum bilobous in dorsal-oblique view; propodeal spines reduced to denticles; postpetiole from above bell-shaped; sculpturing of head limited to carinulae on the anterior third.
Minor: propodeal spines absent, with the basal and declivitous faces of the propodeum joining in a smooth convexity; occiput narrow, with a nuchal collar.
MEASUREMENTS (mm) Holotype major: HW 1.14, HL 1.40, SL 1.00, EL 0.18, PW 0.64.
Paratype minor: HW 0.56, HL 0.72, SL 0.96, EL 0.14, PW 0.40.
COLOR Major: body, mandibles, and scape medium yellowish brown, legs yellow.
Minor: head medium brown with yellow anterior genal border; rest of body light brown; appendages yellow.
RANGE Known only from the type locality.
BIOLOGY Collected from the floor of lowland rainforest.

Compare with *radoszkowskii, triconstricta*, and species listed with them

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Caño El Buque, S. Villavicencio, Meta, 480 m (Charles Kugler). Scale bars = 1 mm.



Pheidole subnuda **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *subnuda,* almost bare (of pilosity).

DIAGNOSIS A member of the *diligens* group, similar to *radoszkowskii* and related species, and distinguished as follows.

Major: posterior dorsal half of head covered by faint longitudinal carinulae; pronotal dorsum transversely rugulose; gaster entirely smooth; pronotal dorsum weakly bilobous; mesosoma hairless.

Minor: posterior third of ventral head profile concave; humerus and mesosomal convexity angulate; head and gaster entirely smooth and shiny; mesosoma and waist entirely foveolate and opaque; dorsal mesosomal profile bearing peculiar short, curving hairs.

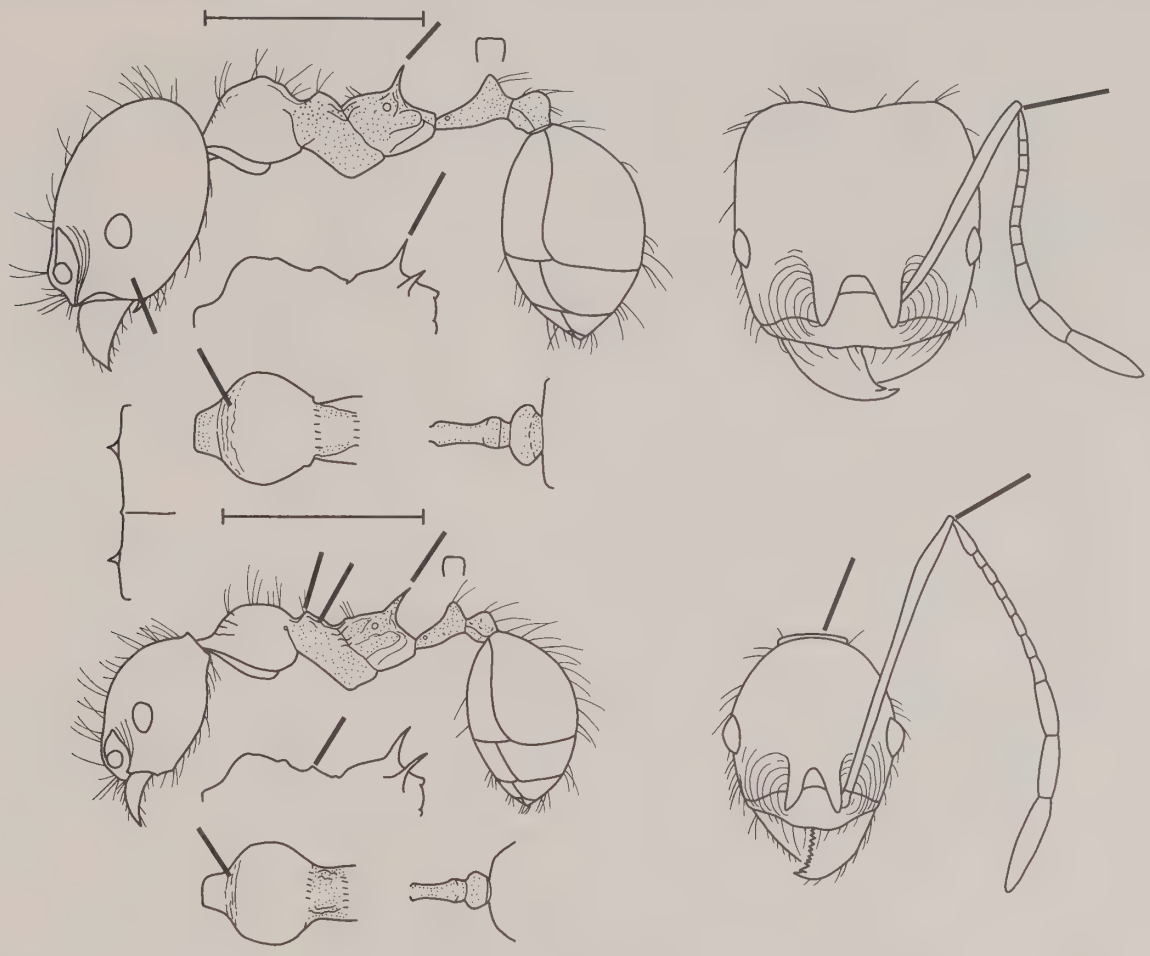
MEASUREMENTS (mm) Holotype major: HW 0.94, HL 0.92, SL 0.66, EL 0.18, PW 0.50.
Paratype minor: HW 0.58, HL 0.62, SL 0.70, EL 0.14, PW 0.38.

COLOR Major: body light brown, appendages dark yellow.
Minor: body medium brown; tarsi yellow, and rest of appendages brownish yellow to light brown.

RANGE Known from the type locality; and from La Parada, San Cristóbal (1100 m) and Palmira (1200 m), both in Tachira, Venezuela (J. Lattke).

BIOLOGY Males were present in the nest at La Parada, Venezuela, on 13 September.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (E. O. Wilson). Scale bars = 1 mm.

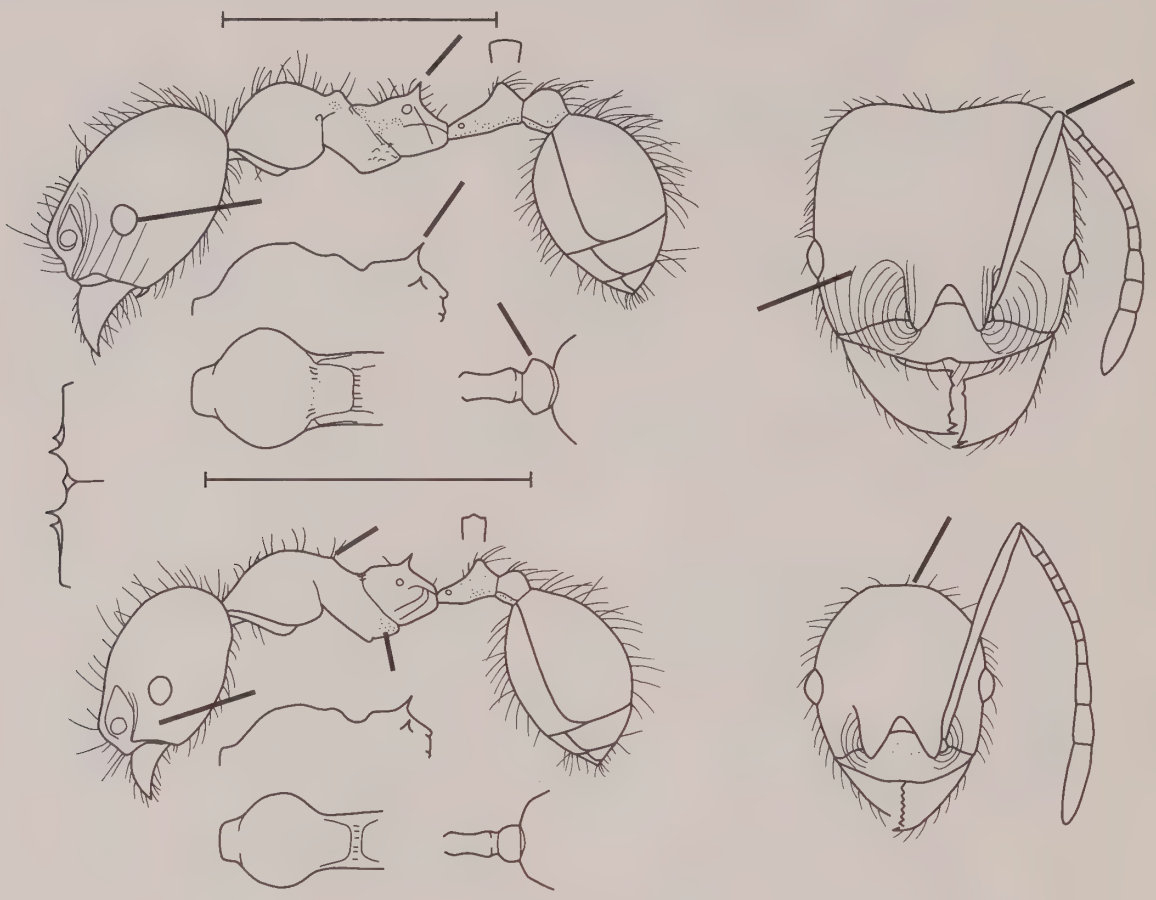


Pheidole tanyscapa **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *tanyscapa,* with stretched-out stem, alluding to the elongated antennal scape.
DIAGNOSIS A member of the *diligens* group, close to *longiscapa* and *rochai,* and distinguished by the following set of traits.
Major: antennal scape exceeding the occiput by 2× the scape maximum width; propodeal spines half as long as the propodeal basal face anterior to them; anterior margin of propodeum rugulose; carinulae absent from genae.
Minor: scapes exceed occipital corner by half their length; propodeal spines half as long as the basal propodeal face; anterior margin of the pronotum transversely carinulate; mesonotal convexity tilted forward on mesonotum, subangular, and marginally carinulate.
MEASUREMENTS (mm) Holotype major: HW 1.00, HL 1.02, SL 0.96, EL 0.20, PW 0.54.
Paratype minor: HW 0.60, HL 0.74, SL 1.10, EL 0.16, PW 0.46.
COLOR Major and minor: concolorous dark yellow.
RANGE Atlantic and Pacific slopes of Costa Rica to 800 m (J. T. Longino 1997).
BIOLOGY Nests in soil in mature rainforest; workers forage on the ground and into low vegetation, at least to some extent nocturnally (Longino 1997). One colony at La Selva was nesting in the soil (M. Byrne).

Compare with *calimana, cataractae, demeter, machetula, scimitara, sicaria*

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Finca Los Guadales, 10 km south of San José del Palmar, Rio Torito, Chocó, 760 m (Charles Kugler). Scale bars = 1 mm.



Pheidole tenuis **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *tenuis,* thin, referring to the body shape.

DIAGNOSIS A member of the *diligens* group similar to *calimana, cataractae, demeter, machetula, scimitara,* and *sicaria,* distinguished as follows.

Major: scape just reaches occipital border; propodeal spines stout, one-fourth as long as basal propodeal face; postpetiolar node laterally angulate; lower mesopleuron and middle of propodeal side with short, broken rugulae; cephalic carinulae do not extend posteriorly beyond eye.

Minor: occiput narrowed but lacking nuchal collar; mesonotal convexity in side view very small and subangulate; genae lacking carinulae.

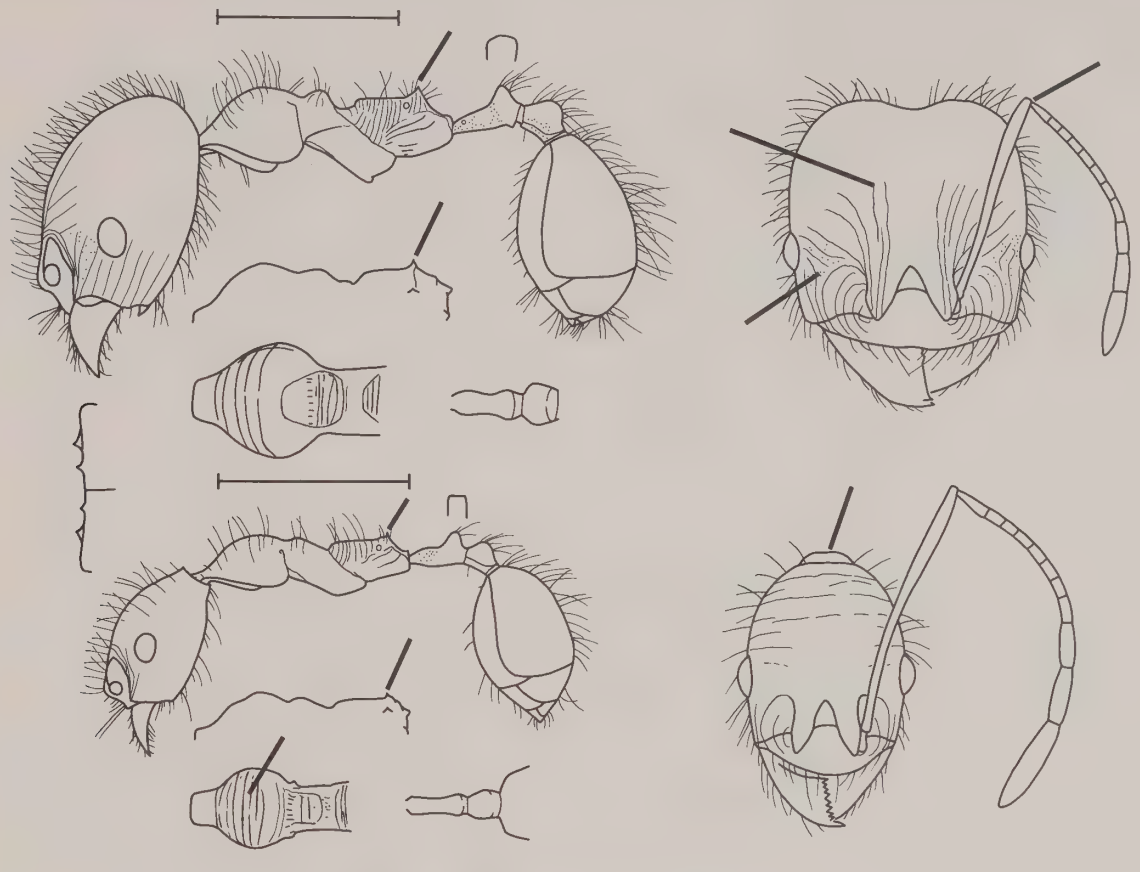
MEASUREMENTS (mm) Holotype major: HW 0.80, HL 0.80, SL 0.84, EL 0.12, PW 0.44.
Paratype minor: HW 0.44, HL 0.52, SL 0.62, EL 0.10, PW 0.28.

COLOR Major: head bicolorous, with narrow strip on clypeus and genae yellowish brown, and remainder dark brown; body concolorous dark brown.
Minor: body blackish brown, appendages medium brown.

RANGE Known only from the type locality.

BIOLOGY Collected from a slope covered by spiny bamboo (*Guadua*).

FIGURE Upper: holotype, major. Lower: paratype, minor. VENEZUELA: east slope of Kamarkabarai Tepui, Bolivar, 5°53′N 62°01′W, 1800 m (J. Lattke). Scale bars = 1 mm.

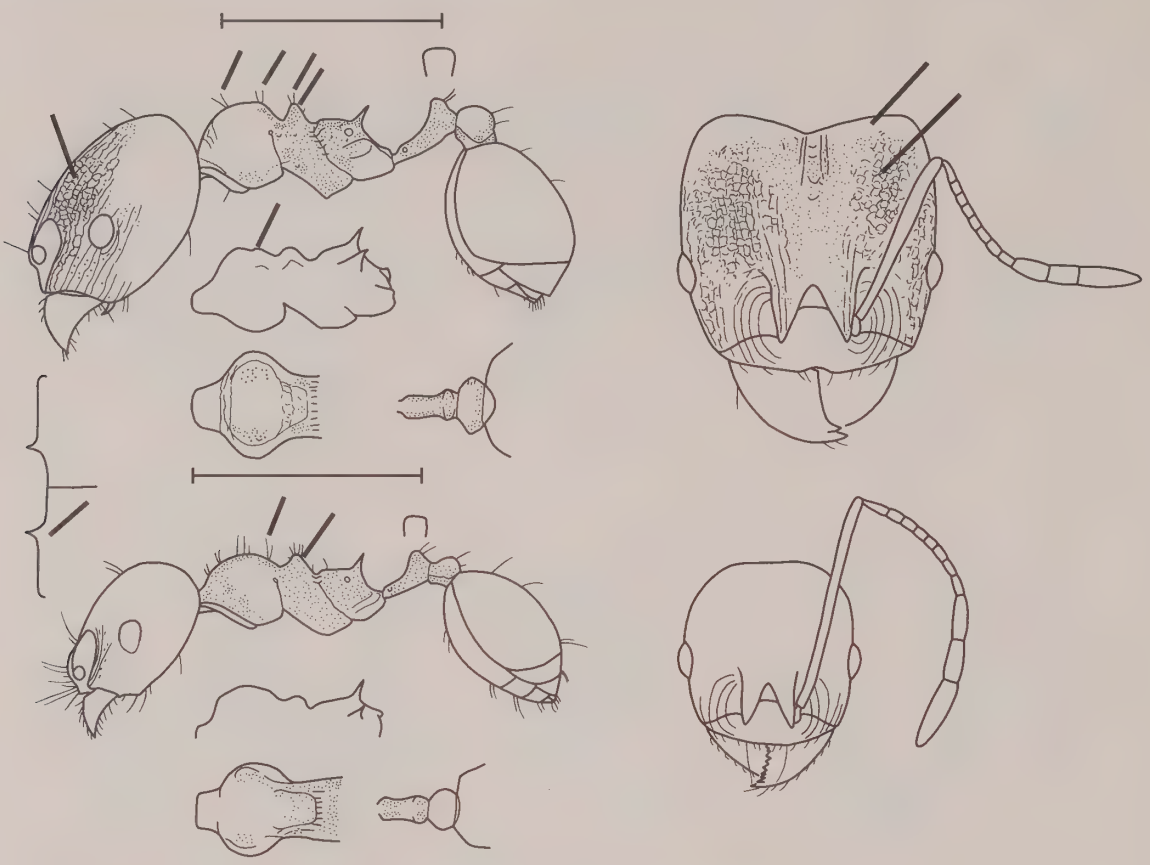


Pheidole tepuicola **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *tepuicola,* tepui dweller.
DIAGNOSIS A member of the *diligens* group, similar to the species listed in the heading, distinguished by the following combination of traits.
Major: antennal scape exceeds occipital lobe by 2× its own maximum width; posterior third of head capsule dorsum smooth and shiny; carinulae originating on the frontal lobes relatively sparse, and those near the frontal carinae bend outward (laterad) toward the lateral margins of the head; propodeal spines reduced to erect denticles.
Minor: nuchal collar relatively thin and indistinct; propodeal spines reduced to erect denticles that point slightly forward; all of posterior dorsal half of head and of mesosomal dorsum crossed by transverse carinulae.
MEASUREMENTS (mm) Holotype major: HW 1.24, HL 1.28, SL 1.08, EL 0.20, PW 0.62.
Paratype minor: HW 0.54, HL 0.80, SL 0.96, EL 0.14, PW 0.40.
COLOR Major: concolorous brownish yellow.
Minor: head and gaster light brown; mesosoma, waist, and appendages brownish yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *radoszkowskii, triconstricta,* and species listed with them

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (Stefan Cover, Mark W. Moffett, John E. Tobin). Scale bars = 1 mm.



Pheidole texticeps **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *texticeps,* woven head, referring to the fabric-like, rugoreticulate dorsal surface of the head.

DIAGNOSIS A member of the *diligens* group, distinguished as follows.

Major: bicolorous; dorsal head surface between eyes and frontal carinae, from the genae almost to but not including the occiput, weakly rugoreticulate; hypostoma with 2 teeth; mesosomal convexity in side view very high, tapering to a blunt point; pronotum bilobous in dorsal-oblique view; mesosoma dorsum with a row of sparse, paired setae; gaster entirely smooth and shiny.

Minor: bicolorous, mesosomal convexity very high; mesosomal dorsum sparsely pilose; dorsal surface of head smooth and shiny.

MEASUREMENTS (mm) Holotype major: HW 0.90, HL 0.92, SL 0.64, EL 0.16, PW 0.48.

Paratype minor: HW 0.52, HL 0.58, SL 0.66, EL 0.14, PW 0.36.

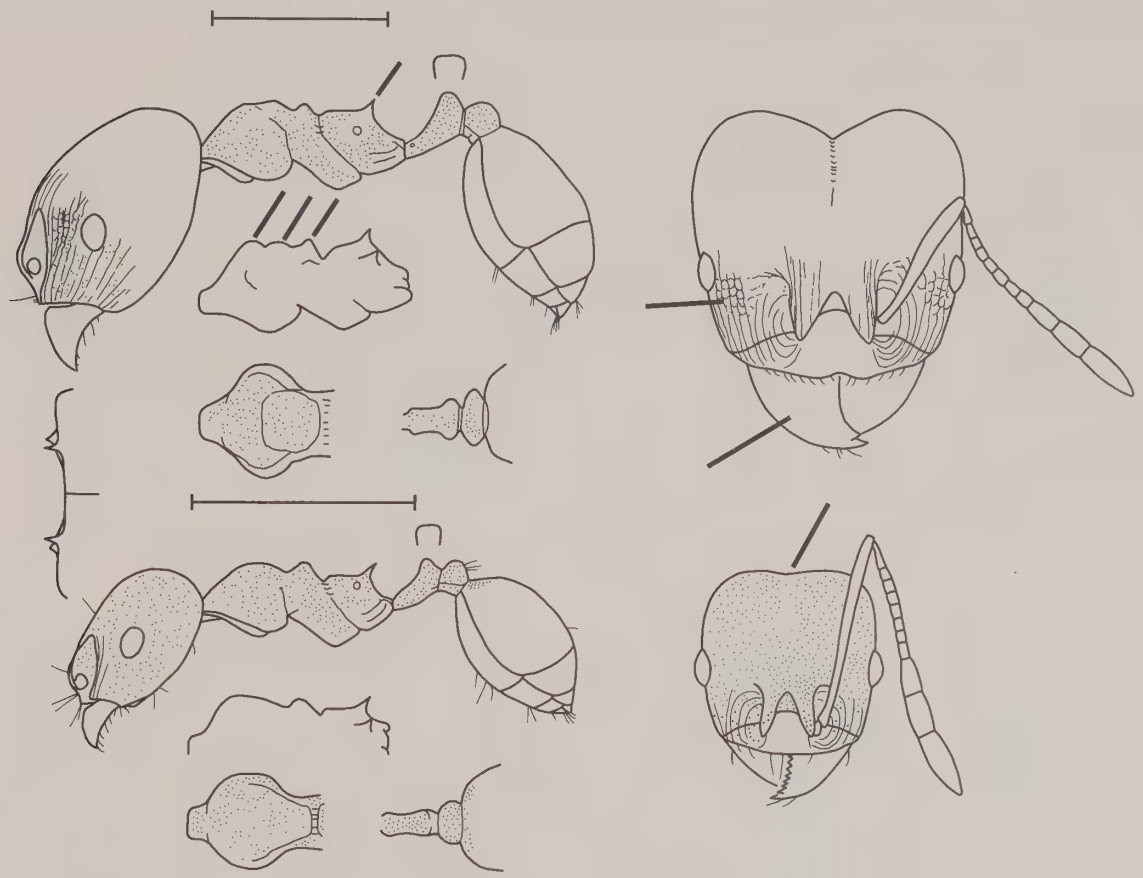
COLOR Major: head, antennae, and mandibles light brown; mesosoma, waist, and legs light brown; gaster dark brown.

Minor: mesosoma, waist, and appendages medium brown; head and gaster blackish brown.

RANGE Known from the type locality, and from nearby Rio Toro Amarillo, in the vicinity of Guapiles, Costa Rica.

BIOLOGY A colony collected at the type locality by Stefan Cover et al. was nesting in primary rainforest in and beneath a rotten branch on the ground.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ARGENTINA: Buenos Aires. Scale bars = 1 mm.



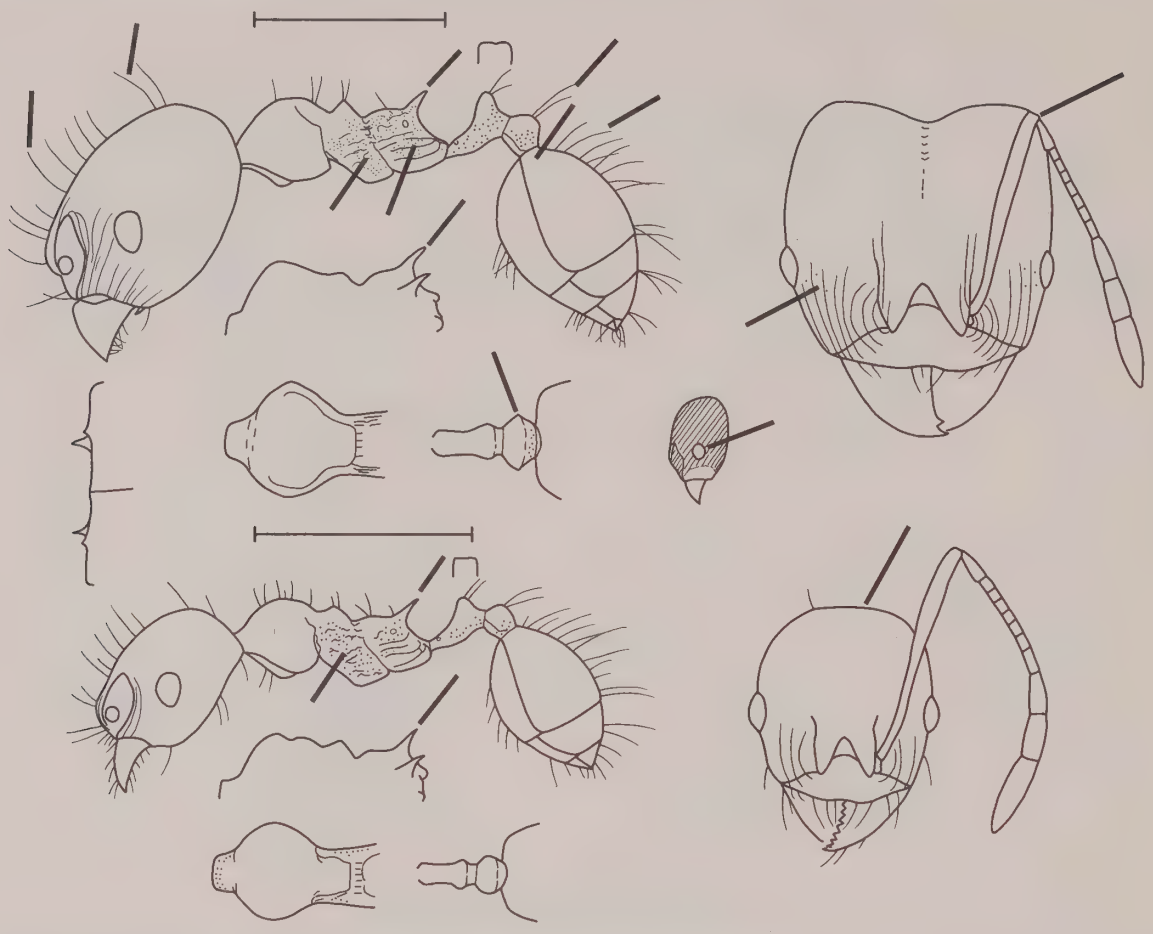
Pheidole triconstricta Forel

Pheidole triconstricta Forel 1886b: xlv. Syn.: *Pheidole triconstricta* var. *ambulans* Emery 1906c: 153, n. syn.; *Pheidole radoszkowskii* var. *saviozae* Forel 1911e: 304, n. syn; *Pheidole radoszkowskii* var. *discursans* Forel 1912g: 223, n. syn.; *Pheidole triconstricta* var. *rosariensis* Forel 1913m: 230, n. syn.; *Pheidole triconstricta* var. *hebe* Santschi 1923d: 55, n. syn.. Raised to species level in this monograph: *bruesi, laidlowi, nubila*.

TYPES Mus. Hist. Nat. Genève; Mus. Comp. Zool. Harvard.
ETYMOLOGY L *triconstricta,* triply contracted, drawn together, evidently referring to the mesosoma, as seen in dorsal-oblique view.
DIAGNOSIS A member of the *diligens* group distinguished by the following combination of traits.
Major: yellow, dorsal surface of head and all of body, including gaster, virtually hairless; promesonotal profile in dorsal-oblique view 3-lobed; rugoreticulum present mesad to the eyes; sculpturing of head confined to the portion level with and anterior to the eyes; posterior half of dorsal head surface, and all of the gaster, smooth and shiny; all of mesosoma and waist foveolate and opaque.
Minor: yellow; mesosoma bare of pilosity; all of head, mesosoma and waist, along with anterior strip of first gastral tergite, foveolate and opaque.
See also *anima, diligens, gagates, nubila, piceonigra, radoszkowskii,* and *stigma*.
MEASUREMENTS (mm) Lectotype major: HW 1.24, HL 1.26, SL 0.74, EL 0.22, PW 0.66.
Paralectotype minor: HW 0.64, HL 0.66, SL 0.66, EL 0.12, PW 0.40.
COLOR Major and minor: concolorous yellow.
RANGE Besides the types and other specimens from Argentina, I have seen specimens form São Paulo, Brazil, Bolivia (Faquira), and Argentina (San Miguel de Tucumán); Kempf lists *triconstricta* in addition from Uruguay and Minas Gerais and Paraná in Brazil.
BIOLOGY Males were present in a nest in San Miguel de Tucumán, Argentina, 18 January – 3 February (W. L. Brown).

Compare with *anima, indistincta, perdiligens, piceonigra*

FIGURE Upper: holotype, major. Lower: paratype, minor. GUATEMALA: El Peten Tikal National Park, near ruins (Walter R. Tschinkel). Scale bars = 1 mm.



Pheidole tschinkeli **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the collector and distinguished myrmecologist Walter R. Tschinkel.

DIAGNOSIS A member of the *diligens* group similar to *anima, indistincta, perdiligens,* and *piceonigra,* differing markedly as follows.

Major: propodeal spines stout, half as long as the basal propodeal face, and curved posteriorly; antennal scapes just reach the occipital border; mesopleuron and sides of propodeum longitudinally rugulose; postpetiolar node laterally angular; pilosity sparse and long, with some hairs 2× the Eye Length; head bicolorous.

Minor: propodeal spines stout, half as long as the basal propodeal face; mesopleuron longitudinally rugulose; occiput narrowed but lacking nuchal collar.

MEASUREMENTS (mm) Holotype major: HW 1.04, HL 1.00, SL 0.82, EL 0.20, PW 0.54.

Paratype minor: HW 0.56, HL 0.66, SL 0.80, EL 0.04, PW 0.42.

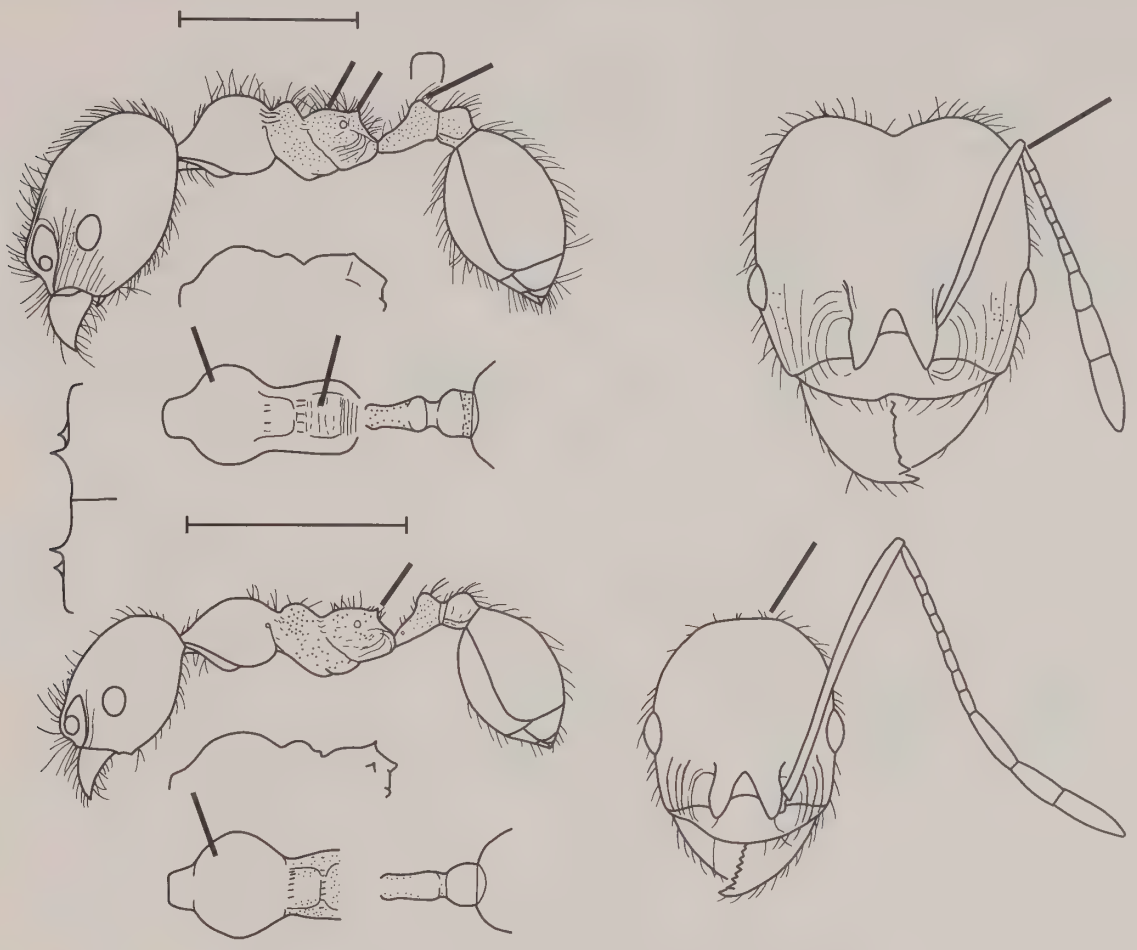
COLOR Major: head and body dark, almost blackish brown except for genae, which are dark yellow; appendages brownish to medium yellow.

Minor: head and body dark, almost blackish brown; appendages brownish to medium brown.

RANGE Known only from the type locality.

BIOLOGY The nest of the type colony was found in a piece of rotten wood near the Tikal ruins.

FIGURE Upper: syntype, major (Mojo, Potosi, Bolivia, not the type locality and not certainly associated with the minor; see Diagnosis below). Lower: syntype, minor (from type locality: Yanalomas, Bolivia). Scale bars = 1 mm.



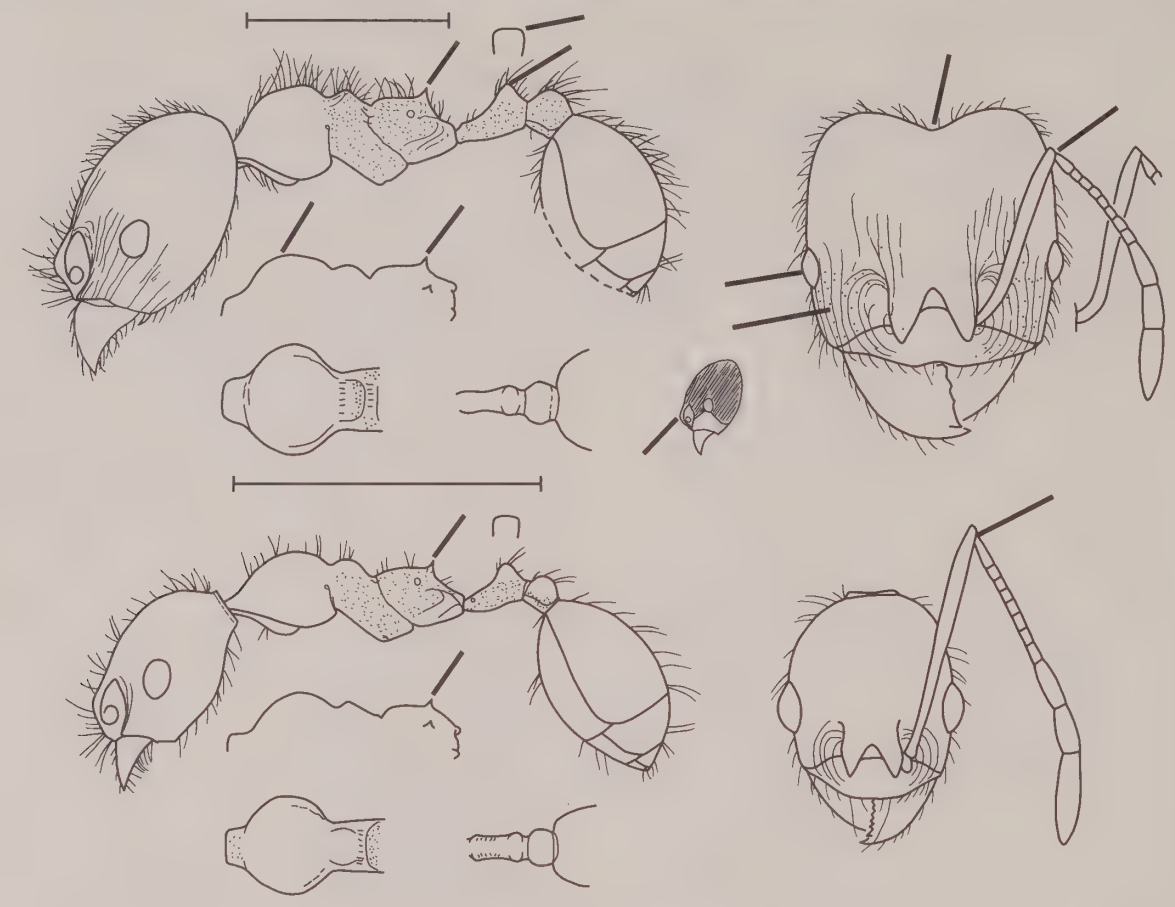
Pheidole vafella Wheeler

Pheidole vafella Wheeler 1925a: 15.

TYPES Royal Mus. Stockholm; Mus. Comp. Zool. Harvard.
ETYMOLOGY L *vafella,* little cunning one.
DIAGNOSIS The major and minor are from different localities, as noted in the figure caption. One or more majors from the type locality may be in the Royal Museum of Stockholm and were not seen by me, hence the association of the two castes I have made here is based on Wheeler's judgment and what does appear to correspond between them in habitus, sculpturing, and pilosity.
P. vafella is somewhat similar to *crozieri* and *williamsi,* differing as follows.
Major: scapes just reach occipital lobes, head heart-shaped in full-face view; propodeal spines reduced to a right angle in side view; propodeal dorsum transversely carinulate; densely covered with short, erect to suberect hairs.
Minor: propodeal spine reduced to denticle; petiolar node low.
MEASUREMENTS (mm) Syntype major (Mojo, Bolivia): HW 1.04, HL 1.08, SL 0.80, EL 0.16, PW 0.56.
Syntype minor (Yanalomas, Bolivia): HW 0.56, HL 0.68, SL 0.84, EL 0.14, PW 0.40.
COLOR Major: concolorous dark yellow.
Minor: concolorous brownish yellow.
RANGE Known only from the two localities in Bolivia listed in the figure caption.
BIOLOGY Unknown.

Compare with *blumenauensis, perryorum, rochai*

FIGURE Upper: lectotype, major. BRAZIL: Blumenau, Santa Catarina. (Outer antennal scape is from near Nariva Swamp, Trinidad.) Lower: minor. TRINIDAD: near Nariva Swamp (compared with paralectotype minor). Scale bars = 1 mm.



Pheidole vafra Santschi

Pheidole vafra Santschi 1923d: 51. Syn.: *Pheidole idiota* Santschi 1923d: 53, n. syn.

TYPES Naturhist. Mus. Basel.

ETYMOLOGY L *vafra,* artful, craftful, allusion unknown.

DIAGNOSIS A small, brown member of the *diligens* group, whose major has a faintly bicolorous head; smooth anterior third of the head dorsal surface; abundant medium-length pilosity; relatively short antennal scapes, which are curved near their base; and equilaterally triangular postpetiolar spine in side view.

Close to *blumenauensis, perryorum,* and *rochai,* but **major** differing in its shorter scapes, eyes larger than in *rochai* (but not in *blumenauensis*) and other details of body form and sculpturing in both major and minor, as illustrated.

See also less similar *laevifrons, lemur, peregrina, pubiventris,* and *seeldrayersi*.

MEASUREMENTS (mm) Lectotype major: HW 0.96, HL 1.04, SL 0.74, EL 0.20, PW 0.54.

Paralectotype minor: HW 0.52, HL 0.64, SL 0.74, EL 0.14, PW 0.36.

COLOR Major: gaster medium brown, rest of body light brown except for anterior one-fourth of head capsule, which is a slightly contrasting brownish yellow.

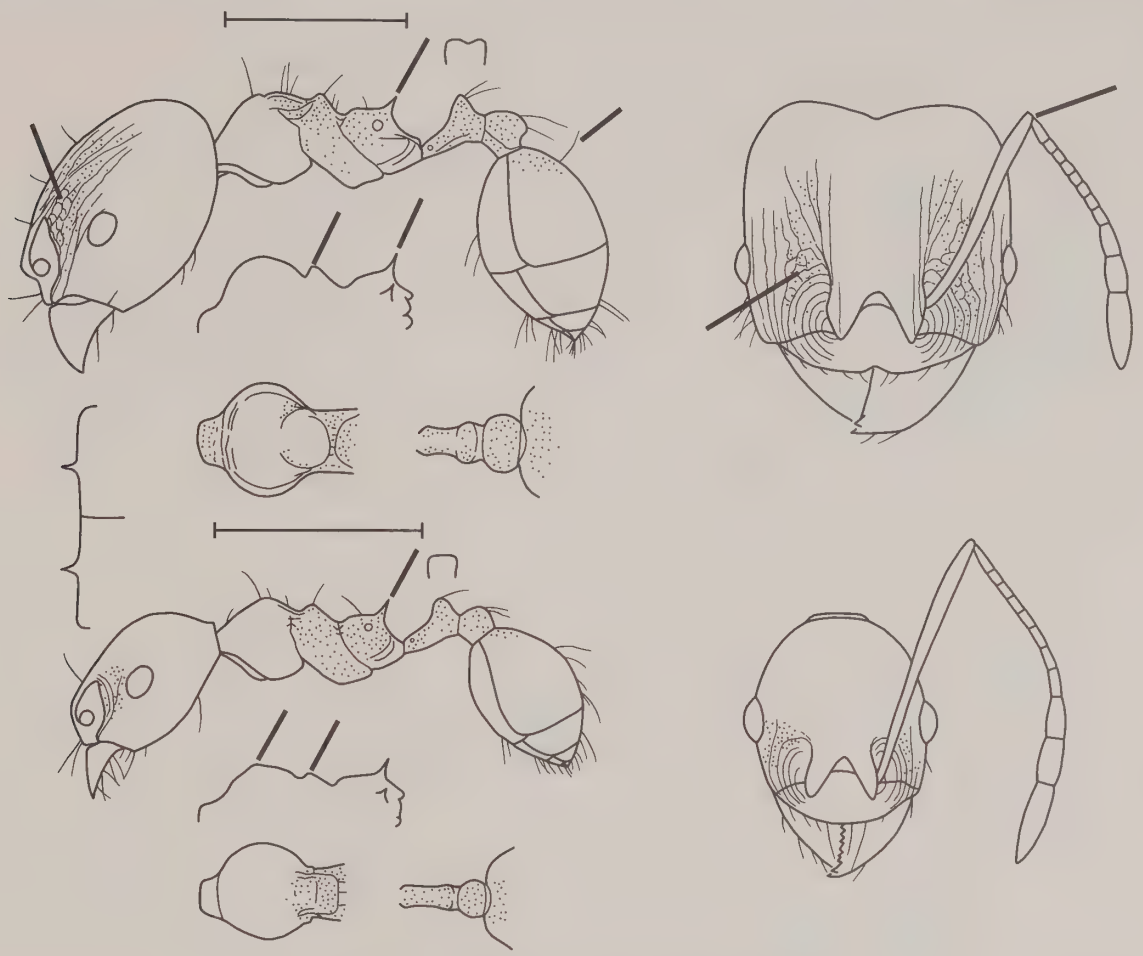
Minor: concolorous medium brown.

RANGE This hitherto obscure species turns out to be one of the most widespread of all New World *Pheidole*. Its records, most of which I have been able to verify, include Nicaragua, Venezuela, Trinidad, Tobago, French Guiana, Amazonian Brazil, Argentina, and Paraguay.

BIOLOGY The very wide distribution of the species suggests that *vafra* may be carried by human commerce. In any case, it inhabits marginal habitats. I found nests common in sandy soil at two localities along the southern coast of Tobago, where it coexists with the very widespread marginal-habitat specialist *P. jelskii*. Near the Nariva Swamp of Trinidad, Stefan Cover found a colony at the border between a coconut grove and mangrove swamp, nesting under a fallen coconut leaf in sand; and a second colony at 550 m in Trinidad's Arima Valley, nesting in the hard-packed clay of a road running through a small coffee plantation.

Compare with *coffeicola,* also
laevifrons, perryorum, pubiventris, seeldrayersi

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. COSTA RICA: San José. Scale bars = 1 mm.

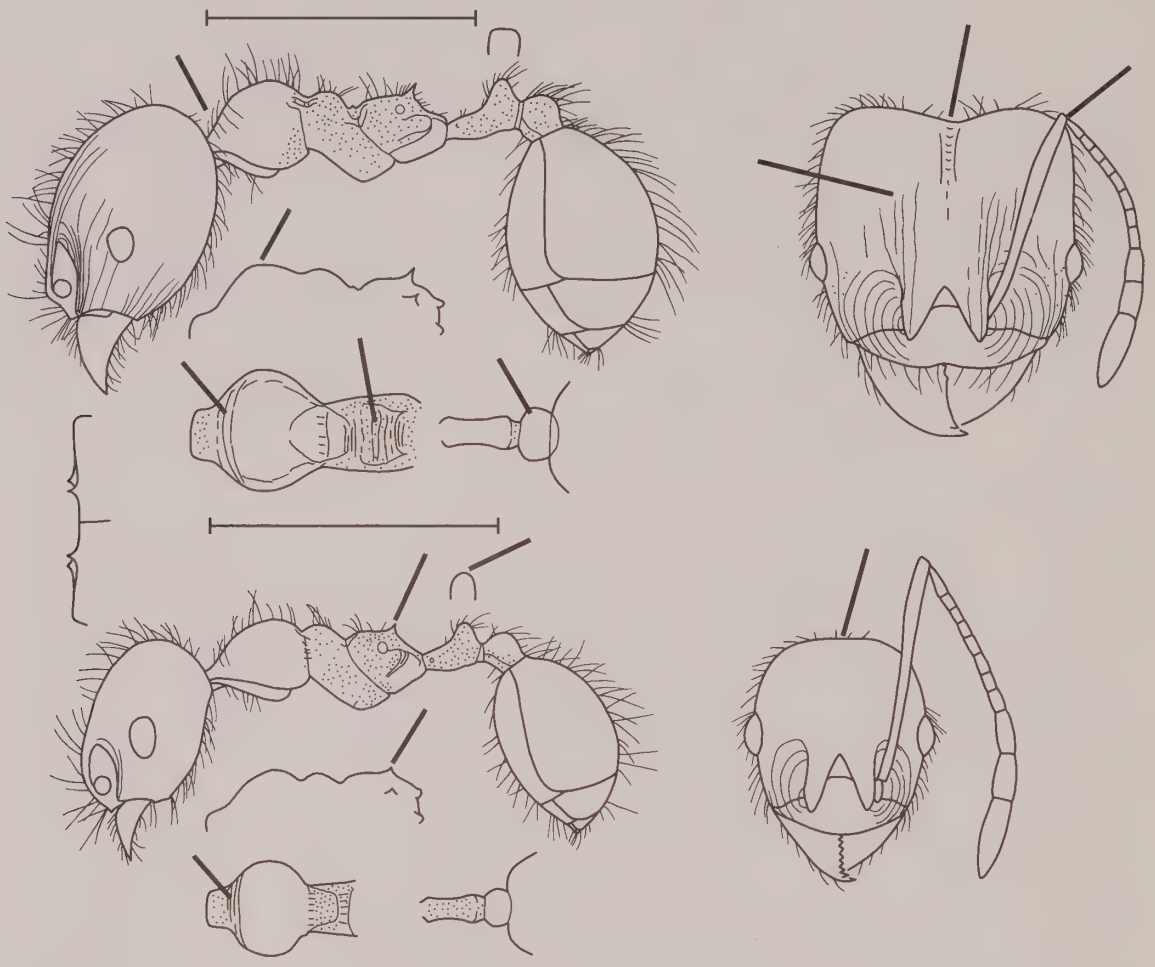


Pheidole variegata Emery, **new status**

Pheidole pubiventris subsp. *variegata* Emery 1896g: 72.

TYPES Mus. Civ. Stor. Nat. Genova.
ETYMOLOGY L *variegata,* different kinds, especially colors, allusion unknown, possibly to bicolorous condition of the minor.
DIAGNOSIS A small member of the *diligens* group with long, sparse erect pilosity and high mesonotal convexity in both castes, along with long, narrow propodeal spines, as well as a narrow band of shagreening in the anteriormost center of the first gastral tergite.
Major: a small patch of rugoreticulum posterior to each antennal fossa.
Minor: humerus with low, blunt denticle present in dorsal-oblique view.
Close to *coffeicola* of Suriname, differing in smaller size, shape of mesonotal convexity and darker color.
See also the less similar *laevifrons*, *pubiventris,* and *seeldrayersi.*
MEASUREMENTS (mm) Holotype major: HW 1.10, HL 1.08, SL 0.92, EL 0.20, PW 0.52.
Paratype minor: HW 0.62, HL 0.74, SL 0.96, EL 0.14, PW 0.40.
COLOR Major: body very light reddish yellow, almost brownish yellow; appendages clear dark yellow.
Minor: bicolorous, with body concolorous reddish yellow and gaster light brown.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. BOLIVIA: vicinity of Las Palmas, Santa Cruz (James C. Trager). Scale bars = 1 mm.



Pheidole veletis **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *veletis,* skirmisher.

DIAGNOSIS Similar to *laevinota* and *rufipilis* and somewhat less to *laevifrons* and *variegata,* differing in the following combination of traits.

Major: yellow; antennal scape just reaching occipital border; humerus smoothly rounded in dorsal-oblique view; postpetiole subtrapezoidal from above; carinulae originating on frontal lobes extend halfway between level of eye and occiput; anterior fringe of pronotum and dorsal surface of propodeum transversely carinulate.

Minor: yellow; anterior fringe of pronotum transversely carinulate; propodeal spine reduced to denticle.

MEASUREMENTS (mm) Holotype major: HW 0.96, HL 0.94, SL 0.72, EL 0.14, PW 0.50.
Paratype minor: HW 0.52, HL 0.58, SL 0.66, EL 0.12, PW 0.38.

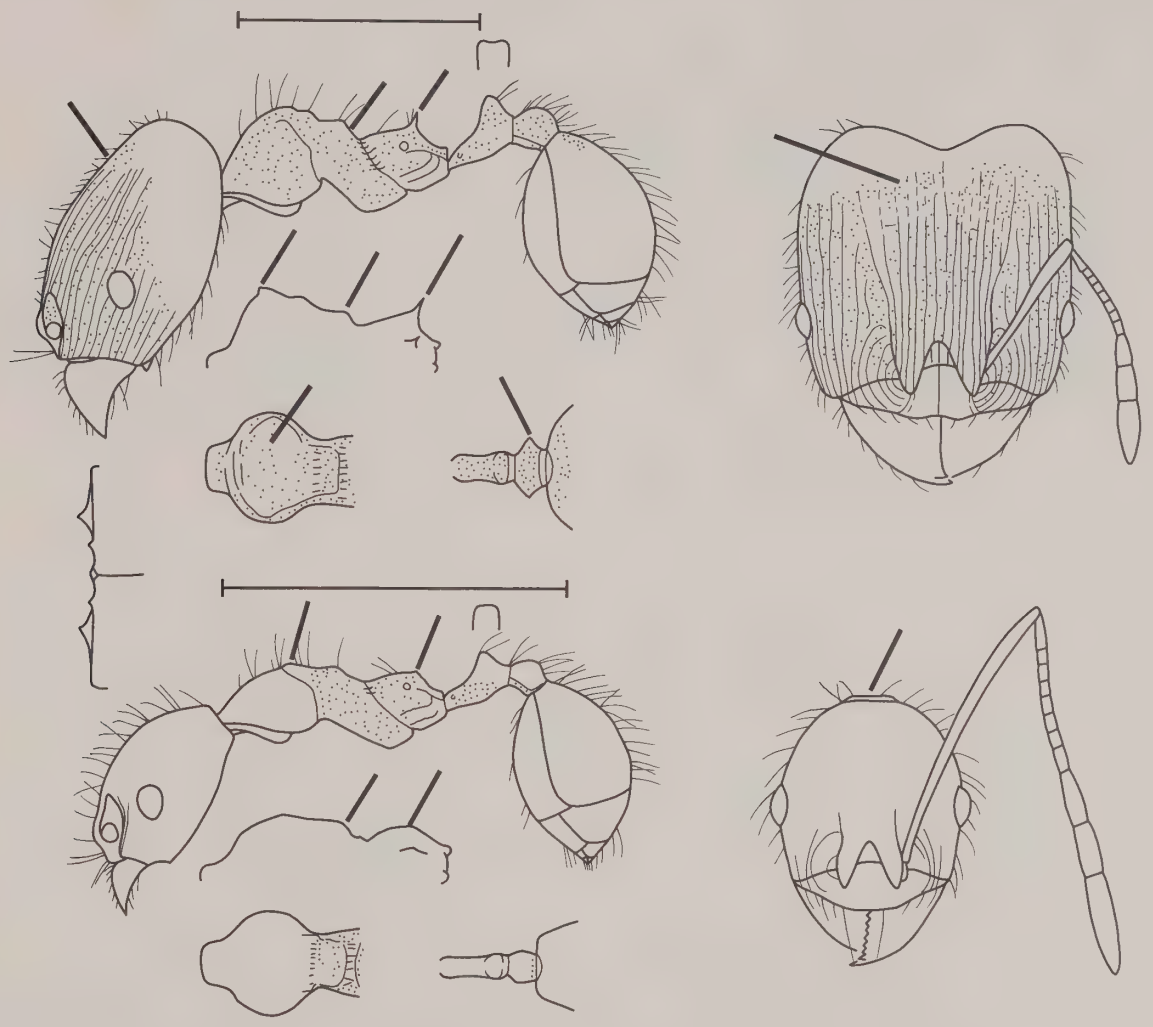
COLOR Major and minor: concolorous medium yellow.

RANGE Known from the type locality (Las Palmas, Bolivia), from Barro Colorado Island, Panama, and from Santarém, Pará, Brazil.

BIOLOGY A colony found by Alfred Emerson on Barro Colorado Island, Panama, was nesting in a rotten log on the forest floor.

Compare with *coffeicola, gagates, hoelldobleri, mooreorum, peregrina, spilota, zelata*

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Finca El Recreo, Bonda, Magdalena, 850 m (Charles Kugler). Scale bars = 1 mm.



Pheidole venatrix **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *venatrix,* huntress.

DIAGNOSIS A member of the *diligens* group similar in various characters to the species listed in the heading above, distinguished as follows.

Major: small "sharkfin" extension present on humerus in dorsal-oblique view; propodeal spines thin and one-third as long as the basal propodeal face; mesonotal convexity low and subangulate; posterior dorsal half of head in side view weakly concave; postpetiolar node spinose; rugoreticulum absent on head; carinulae of head extend most of the way past eye level to the occiput.

Minor: propodeal spine absent; mesonotal convexity in dorsal-oblique view with posterior face only; occiput narrowed with nuchal collar.

MEASUREMENTS (mm) Holotype major: HW 0.94, HL 1.00, SL 0.50, EL 0.10, PW 0.46.
Paratype minor: HW 0.44, HL 0.56, SL 0.68, EL 0.08, PW 0.30.

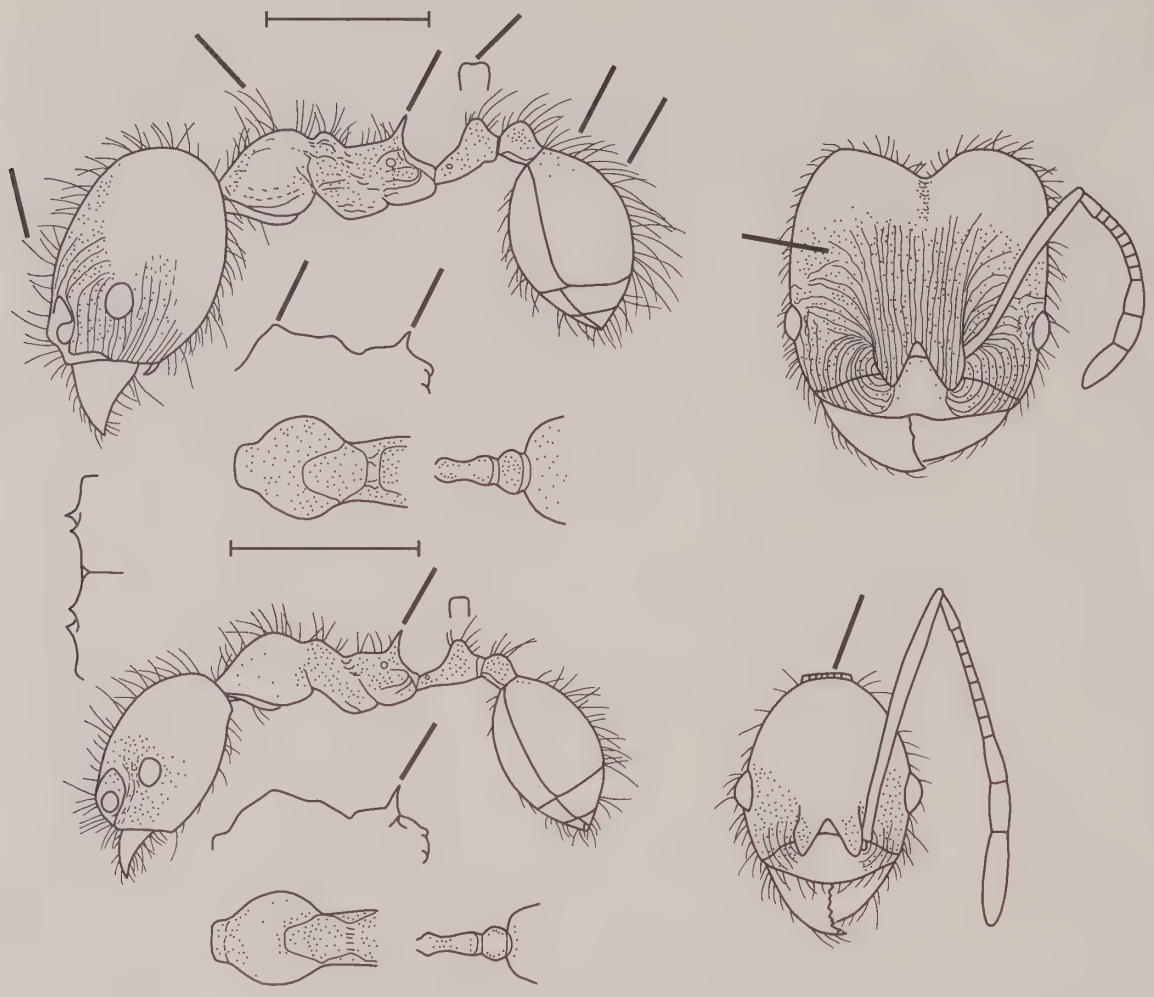
COLOR Major: body and mandibles plain medium brown, other appendages yellowish brown.

RANGE Known only from the type locality.

BIOLOGY The type series was collected by Charles Kugler in a montane *cafetal* (coffee plantation).

Compare with *boruca,* also
aculifera (in the *fallax* group), *prostrata, variegata*

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Rio Peñas Blancas, Alajuela, 950 m (J. Longino). Scale bars = 1 mm.



Pheidole violacea **new species**

TYPES INBio.

ETYMOLOGY L *violacea,* violet-colored, referring to the bluish to violaceous reflections of the minor body.

DIAGNOSIS **Major**: medium brown body with bicolorous head; carinulae originating from the posterior sections of the frontal lobes curve laterally to end near the eyes; pilosity overall dense and very long; pronotal humerus cornulate in dorsal-oblique view.
Minor: body and head light brown with unusual local bluish reflections in certain lights.
Similar to *boruca* of Costa Rica but that species is darker colored, lacking bluish or violaceous reflections in the minor; and the major has a foveate occiput, more extensive outward curving carinulae on the head, and rounded pronotal humeri in dorsal-oblique view.
See also the less similar *aculifera* (in the *fallax* group), *prostrata,* and *variegata*.

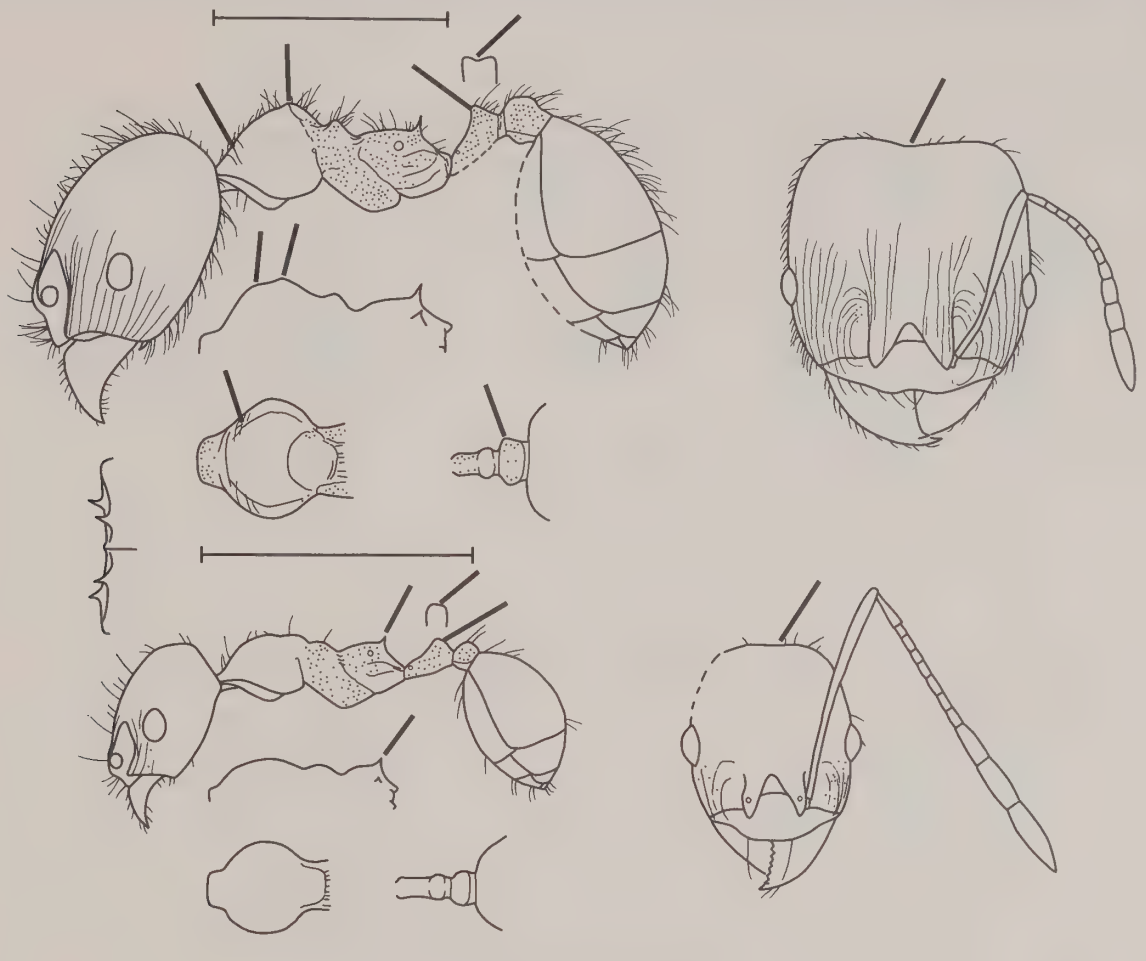
MEASUREMENTS (mm) Holotype major: HW 1.30, HL 1.36, SL 1.10, EL 1.02, PW 0.64.
Paratype minor: HW 0.64, HL 0.80, SL 1.02, EL 0.20, PW 0.44.

COLOR Major: body and head concolorous medium brown, except for genae anterior to the eyes, which are yellowish brown; appendages light brown, tarsi yellow.
Minor: body and appendages concolorous light brown except tarsi, which are yellow; bluish to violaceous reflections occur over most of the body in certain angles of light, in small patches at a time.

RANGE Upper elevation of the Cordillera de Tilaran, on the Atlantic slope of Costa Rica (J. T. Longino 1997).

BIOLOGY Longino (1997): known only from the Peñas Blancas Valley, where it nests in globular ant gardens in wet forest clearings. E.g.: "carton/soil *fiorii*-like nest on low vegetation. Polydomous, with one nest enveloping stems of shrub, second nest less than 1 m away on underside of *Xanthosoma* leaf. First nest was covered with small dicot seedlings, all at the cotyledon stage. . . A well-developed ant garden in front of house, with large epiphytes. Nest about half the size of a soccer ball, discrete and irregularly spherical, on stem of *Urera* . . . I later saw more of these ant gardens, with the same *Pheidole* and the same epiphytes." Winged queens were present in one nest 21 June 1991.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. GALÁPAGOS ISLANDS: Isla Santa Cruz. Scale bars = 1 mm.



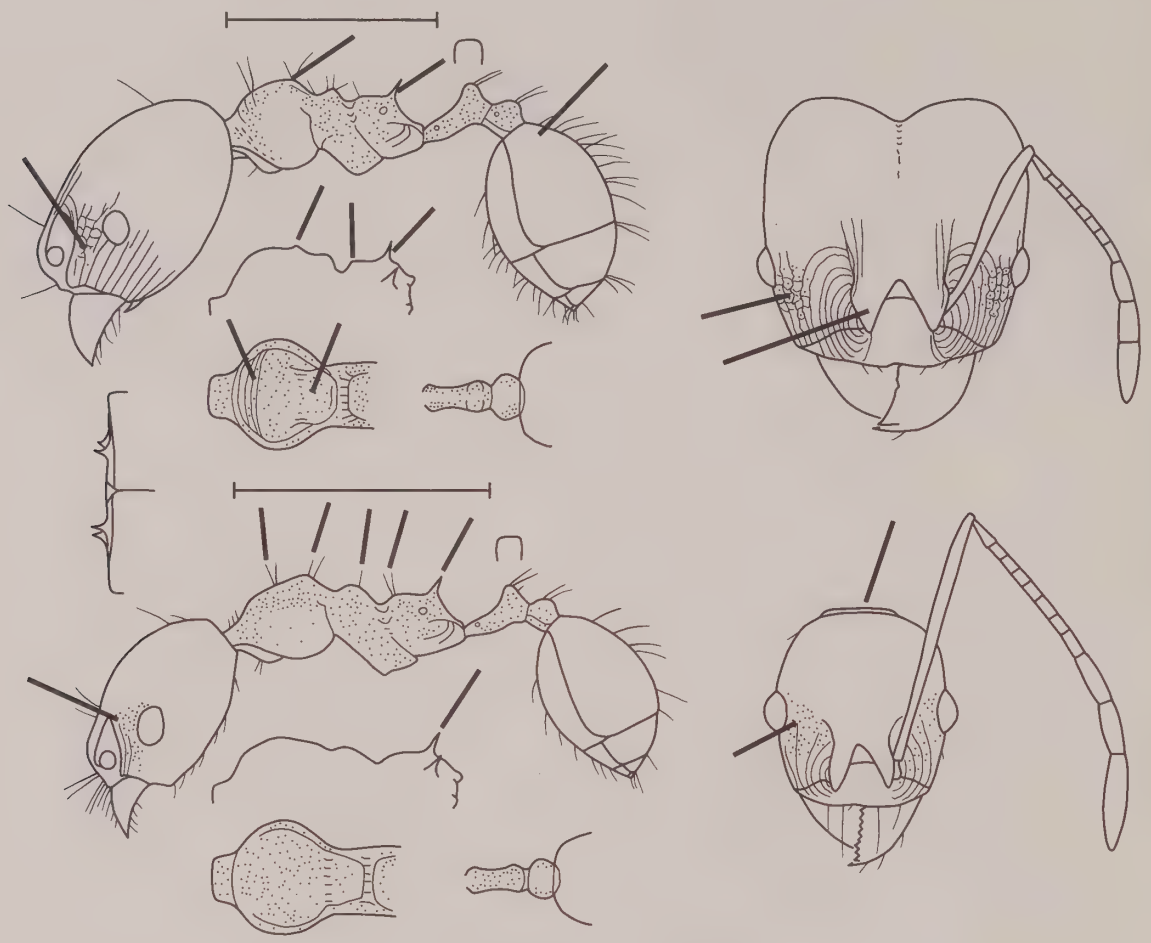
Pheidole williamsi Wheeler

Pheidole williamsi Wheeler 1919d: 267. Syn.: *Pheidole williamsi* var. *seymourensis* Wheeler 1924b: 108, n. syn.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after Harrison Williams, leader of a Galápagos collecting expedition.
DIAGNOSIS A small, yellow member of the *diligens* group, closest to *crozieri* of Peru, but also with some similarities to *vafella,* as well as *rufipilis* and the mostly South American species listed with *rufipilis* (q.v.), differing from *crozieri* as follows.
Major: dark yellow; pronotum in side view peaked in a blunt angular profile, and weakly bilobous in dorsal-oblique view; occiput weakly concave; anterior margin of pronotal dorsum carinulate; apex of petiolar node in side view tapering to a blunt point.
Minor: petiolar node in side view relatively low, and in rear view with dorsal border strongly convex.
MEASUREMENTS (mm) Lectotype major: HW 1.04, HL 1.10, SL 0.74, EL 0.16, PW 0.52.
Paralectotype minor: HW 0.48 (approximately), HL 0.62, SL 0.66, EL 0.12, PW 0.30.
COLOR Major: concolorous dark yellow.
Minor: body brownish yellow, appendages dark to medium yellow.
The Wheeler types may be faded; minors collected on Isla San Salvador in 1991 (P. Oromi) have light brown bodies.
RANGE Known only from Isla Santa Cruz, Isla Seymour, and Isla San Salvador. An apparent endemic of the Galápagos Islands. The species appears to be rare.
BIOLOGY Males were collected with the lectotype series in November 1905.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. BOLIVIA: 35 km south-southeast of Flor de Oro, Santa Cruz, 13°50′S 60°52′W, 450 m (Philip S. Ward). Scale bars = 1 mm.



Pheidole zelata **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *zelata,* ardent, enthusiastic.

DIAGNOSIS A member of the *diligens* group similar in various characters to *coffeicola, gagates, hoelldobleri, mooreorum, peregrina, spilota,* and *venatrix,* distinguished as follows.

Major: reddish yellow; propodeal spine long, narrow, needle-like; rugoreticulum present between eye and antennal fossa; pronotal dorsum, foveolate, its anterior fourth transversely carinulate; anterior face of propodeum seen in dorsal-oblique view drops precipitously to metanotum; a small convexity present in middle of pronotal dorsum.

Minor: propodeal spine thin, needle-like; space between eye and antennal fossa both foveolate and carinulate; rest of head smooth; all of mesosoma foveolate; pilosity on dorsal mesosomal border consists of evenly spaced pairs of setae.

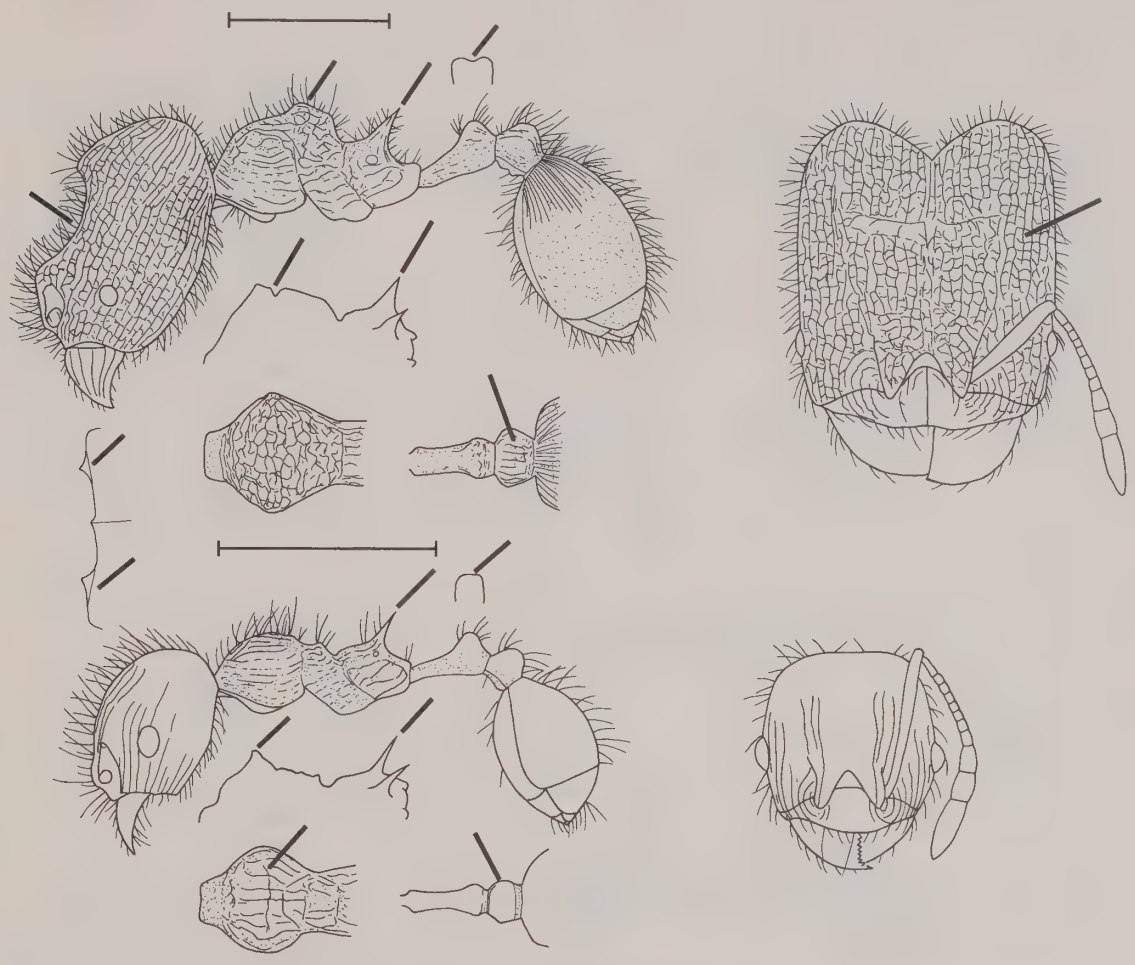
MEASUREMENTS (mm) Holotype major: HW 1.22, HL 1.22, SL 0.92, EL 0.22, PW 0.60.
Paratype minor: HW 0.60, HL 0.68, SL 0.90, EL 0.18, PW 0.42.

COLOR Major: light reddish yellow except for head anterior to eyes and appendages, which are plain yellow.
Minor: head and body light brown except head anterior to eyes and gaster, which are brownish yellow; antennae brownish yellow; rest of appendages plain yellow.

RANGE Known only from the type locality.

BIOLOGY The majors and minors in the type series were collected as foragers on the ground of rainforest.

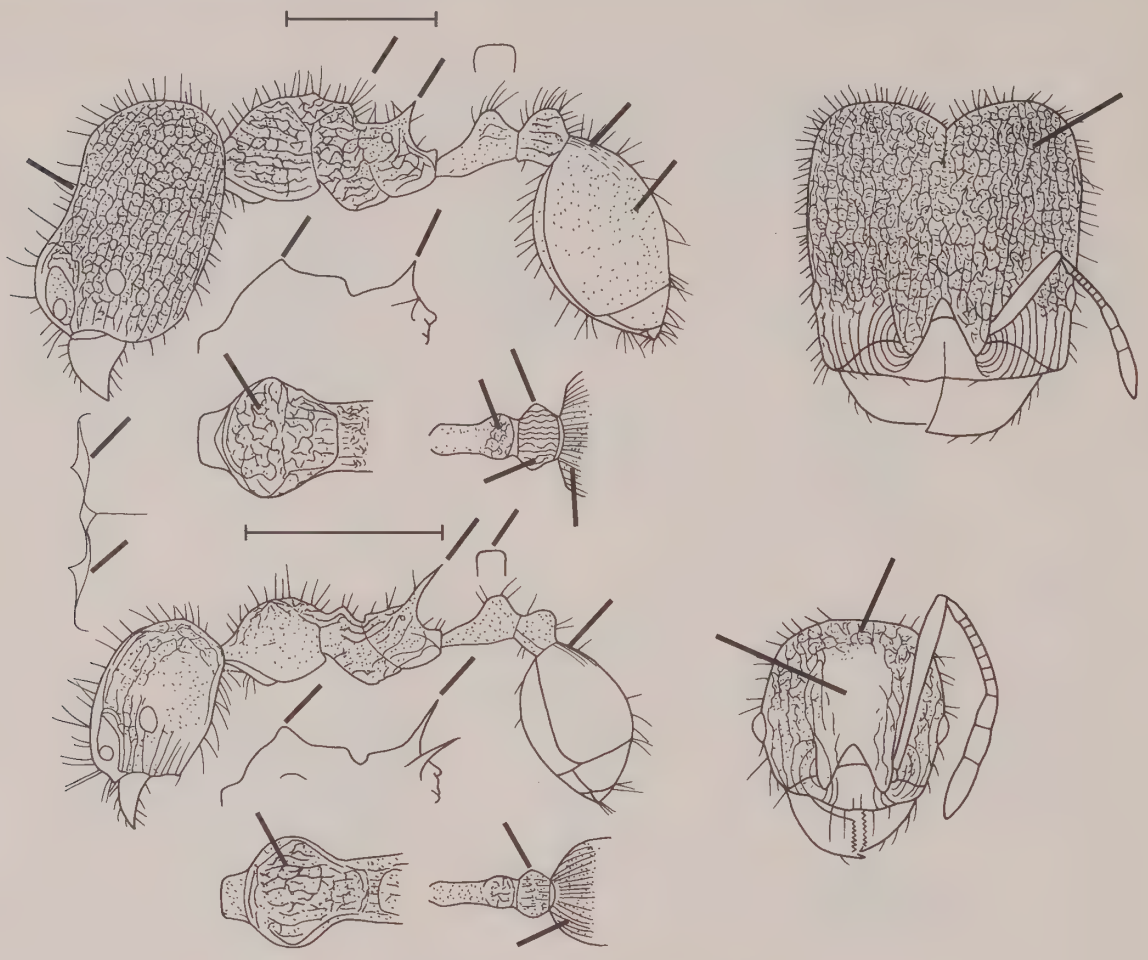
FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: trail to waterfall, Véu de Noira, Chapada dos Guimarães, Mato Grosso (James C. Trager). Scale bars = 1 mm.



Pheidole bufo **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *bufo,* toad.
DIAGNOSIS A very distinct member of the *distorta* group, recognizable by the following traits.
Major: central third of dorsal head surface in side view deeply concave; all of dorsal surface of head except clypeus and frontal triangle, and all of pronotal dorsum, strongly rugoreticulate; hypostoma bidentate; sides of mesosoma and dorsum of postpetiolar node carinulate; anterior third of first gastral tergite finely striate, remainder foveolate and opaque; humerus right-angulate and posteriorly notched in dorsal-oblique view; propodeal spine very large, nearly 2× as long as the basal face of the propodeum anterior to it.
Minor: humerus surmounted by a blunt spine in dorsal-oblique view; propodeal spines nearly as long as the basal propodeal space; mesosoma almost completely covered by longitudinal carinulae.
MEASUREMENTS (mm) Holotype major: HW 1.64, HL 1.92, SL 0.84, EL 0.22, PW 0.78.
Paratype minor: HW 0.84, HL 0.82, SL 0.74, EL 0.18, PW 0.54.
COLOR Major and minor: body dark brown, appendages light to medium brown.
RANGE In addition to the type colony from Brazil, the species has been found in Colombia (near Leticia) and Ecuador (Yasuni National Park, near Puerto Tiputini).
BIOLOGY James C. Trager, the collector, found the workers feeding on a crushed scarab larva.

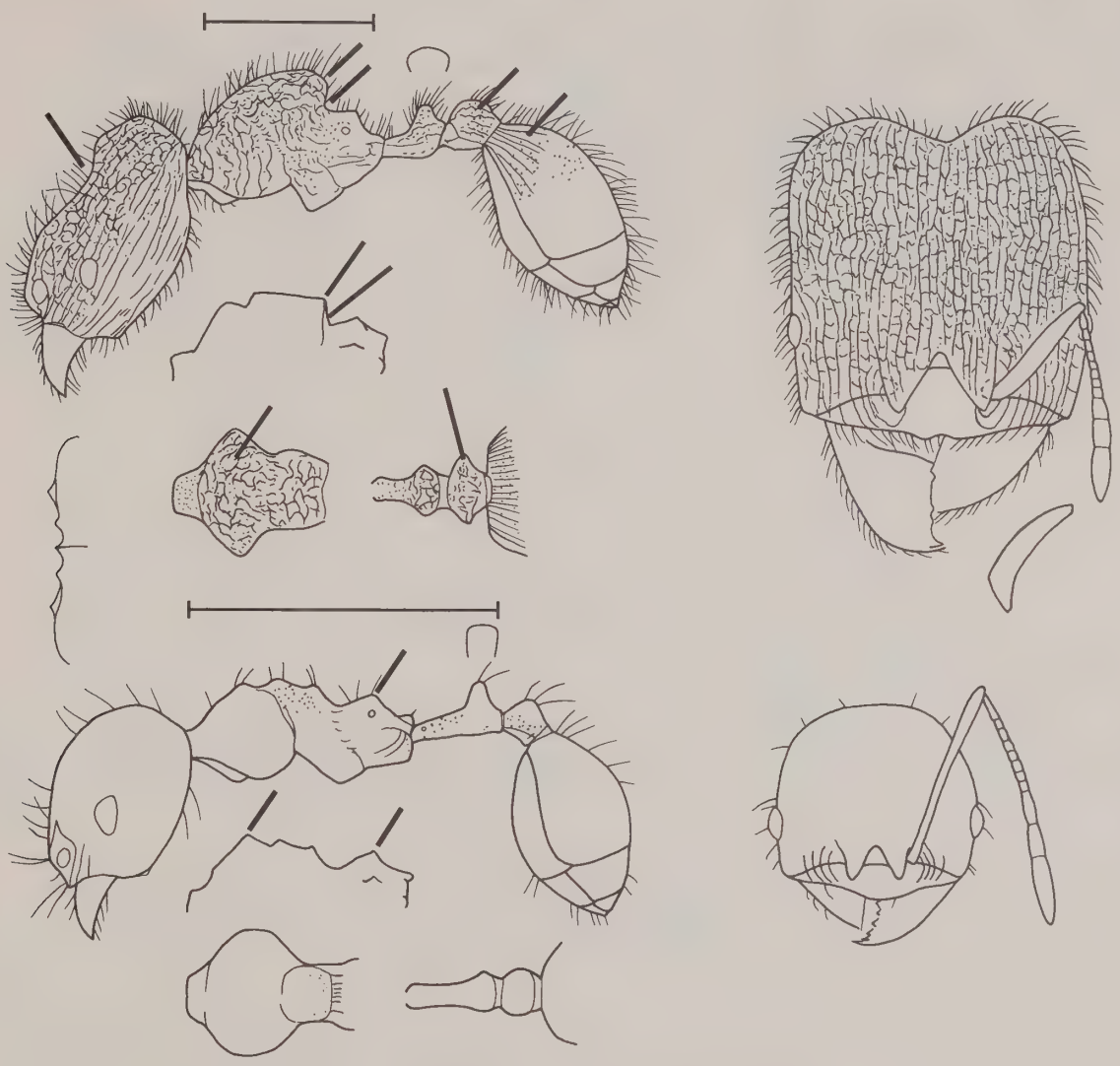
FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: World Wildlife Fund-U. S. Field Station, 90 km north of Manaus (H. G. Fowler). Scale bars = 1 mm.



Pheidole deima **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *deima,* a fearful thing.
DIAGNOSIS A member of the *distorta* group, characterized by the following combination of traits.
Major: central half of head in side view moderately concave; almost entire head, including genae and frontal lobes, strongly rugoreticulate; also, all of mesosoma and dorsum of petiolar node rugoreticulate; dorsum of postpetiolar node longitudinally carinulate; central section of anterior third of first gastral tergite striate; promesonotal profile weakly bilobed and overall symmetrical; propodeal spines robust, as long as the basal propodeal face.
Minor: all of posterior half of cephalic dorsum except for central strip rugoreticulate; pronotal dorsum rugoreticulate; central strip of anterior third of first gastral tergite striate; propodeal spines extremely long.
MEASUREMENTS (mm) Holotype major: HW 1.74, HL 1.92, SL 0.80, EL 0.20, PW 0.84.
Paratype minor: HW 0.80, HL 0.84, SL 0.76, EL 0.16, PW 0.54.
COLOR Major: body dark brown, appendages medium brown except for tarsi, which are yellow.
Minor: body medium brown, appendages light brown.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: major. Lower: minor. COLOMBIA: Parque Tayrona, Magdalena. (Minor compared with syntype in Forel Collection, Mus. Hist. Nat. Genève.) (Type locality: Santa Marta, Magdalena.) Scale bars = 1 mm.

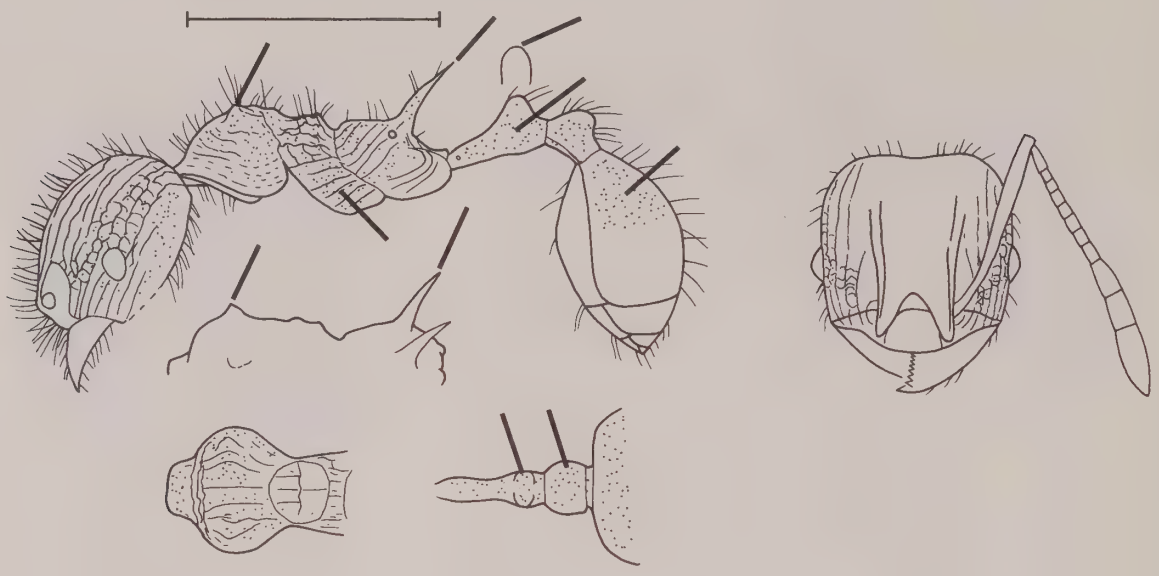


Pheidole distorta Forel

Pheidole distorta Forel 1899e: 74.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY L *distorta,* misshapen, deformed.
DIAGNOSIS A bizarre member of the *distorta* group, closest to *monstrosa, reclusi,* and *scapulata,* distinguished from these and other species in the group by the absence of propodeal spines and, in the **major**, by an extreme bulging, "humpback" promesonotal profile, with the mesonotum descending to the basal propodeal face by a long vertical plane. Also remarkable in the contrast between the heavily sculptured **major**, with the dorsa of the head and promesonotum rugoreticulum, and the entirely smooth and shiny **minor**.
MEASUREMENTS (mm) Major (Parque Tayrona, Colombia): HW 1.16, HL 1.36, SL 0.56, EL 0.14, PW 0.82.
Minor (Parque Tayrona): HW 0.60, HL 0.60, SL 0.56, EL 0.12, PW 0.38.
COLOR Major: body concolorous dark reddish brown except for gaster, which is blackish brown.
Minor: body concolorous medium reddish brown except for gaster, which is blackish brown; mandibles yellow.
RANGE Known only from Magdalena, northern Colombia.
BIOLOGY Unknown.

FIGURE Holotype, minor. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios (Stefan Cover and John E. Tobin). Scale bar = 1 mm.



Pheidole dolon **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *dolon,* dagger, stiletto, referring to the propodeal spines of the minor.

DIAGNOSIS A member of the *distorta* group, known only from the **minor** caste, closest (in the minor caste at least) to *bufo,* differing in the minor by the extremely long propodeal spines, which are longer than the basal face of the propodeum anterior to them; sparser pilosity; relatively low promesonotal dorsal-oblique profile; foveolate and opaque waist; shagreened anterior half of the first gastral tergite; and distinctive color.

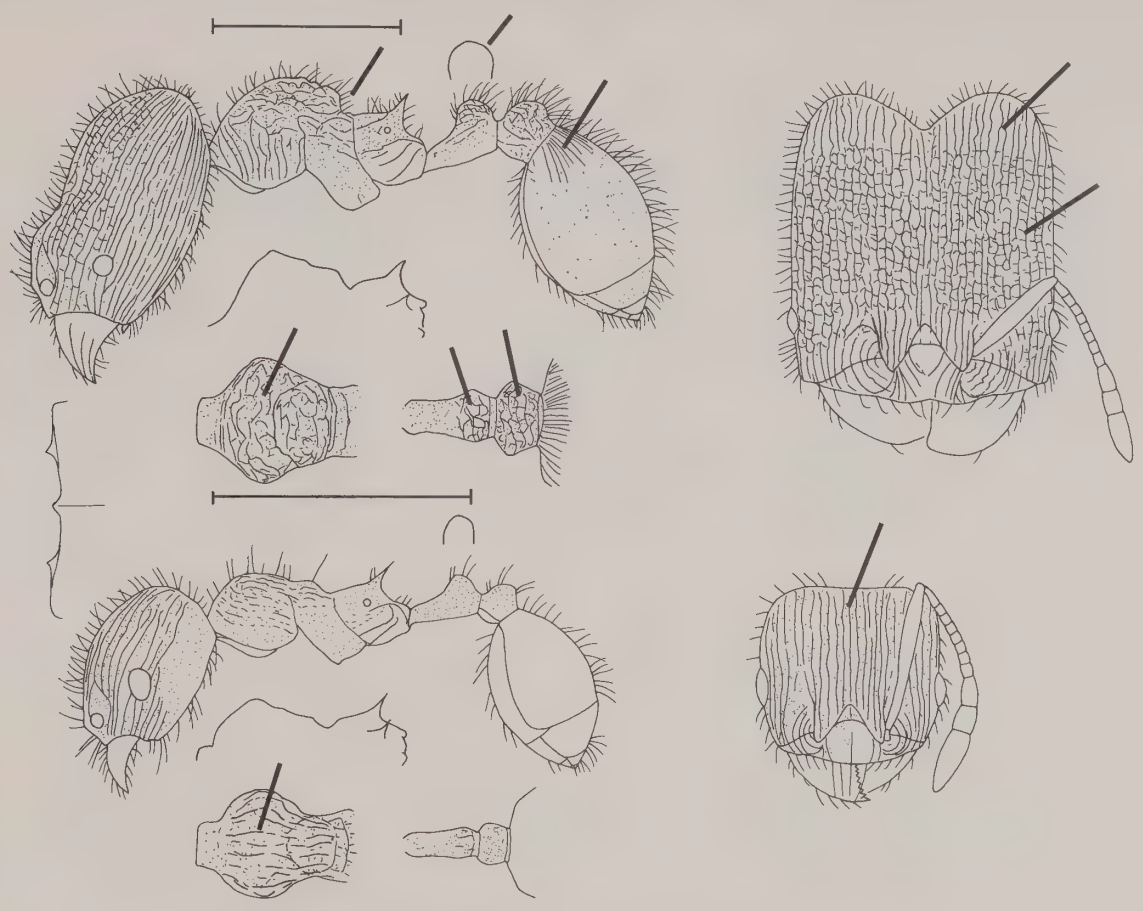
MEASUREMENTS (mm) Holotype minor: HW 0.82, HL 0.82, SL 0.80, EL 0.16, PW 0.54.

COLOR Minor: body dark, almost blackish brown; appendages yellow, with central halves of the femora light brown.

RANGE Known from the type locality, as well as widespread records in Bolivia, Colombia, and Amazonian Brazil.

BIOLOGY Found in lowland tropical rainforest to 450 m.

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: Cuiabá, Mato Grosso (James C. Trager). Scale bars = 1 mm.

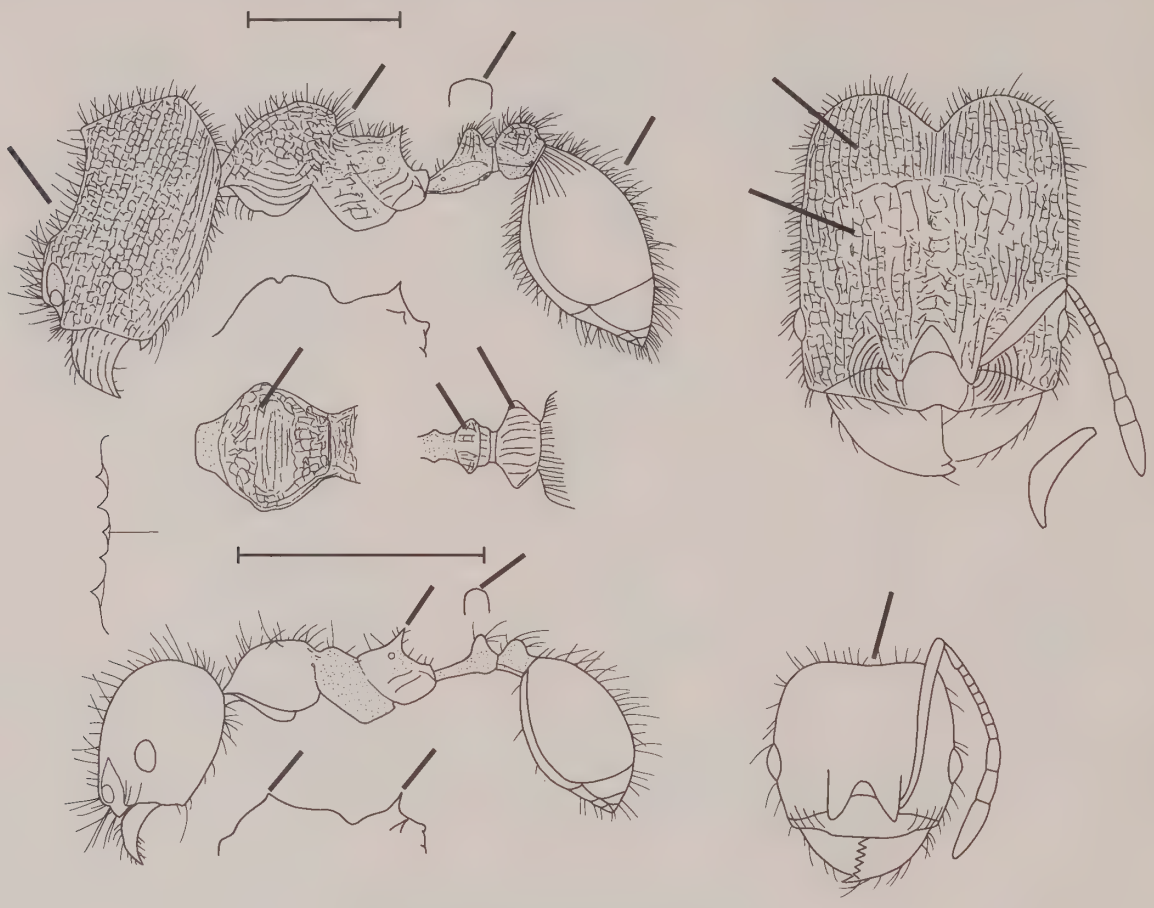


Pheidole monstrosa **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY NL *monstrosa,* strange.
DIAGNOSIS A member of the *distorta* group, closest to *distorta, reclusi,* and *scapulata,* differing in the following combination of traits.
Major: dorsal half of head in side view moderately concave; occiput, frontal lobes, frontal triangle, and clypeus longitudinally carinulate, rest of dorsal head surface rugoreticulate; dorsa of promesonotum, petiolar node, and postpetiolar node rugoreticulate; anterior fourth of first gastral tergite striate; promesonotum in profile raised and strongly convex, descending to the metanotum through a nearly vertical face.
Minor: almost all of head and all of promesonotal dorsum conspicuously carinulate.
MEASUREMENTS (mm) Holotype major: HW 1.42, HL 1.84, SL 0.68, EL 0.20, PW 0.84.
Paratype minor: HW 0.64, HL 0.64, SL 0.56, EL 0.12, PW 0.42.
COLOR Major: head and mesosoma light to medium reddish brown, waist and gaster dark brown, appendages medium brown.
Minor: body and head dark brown except anterior fifth of gena, which is yellowish brown; appendages medium to dark brown.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *distorta*;
see also *monstrosa, scapulata*

FIGURE Upper: major (compared with syntype by W. L. Brown). Lower: minor. COLOMBIA: 2–3 km above Minca, Magdalena. (Type locality: San Antonio, Sierra Nevada de Santa Marta, Magdalena.) Scale bars = 1 mm.

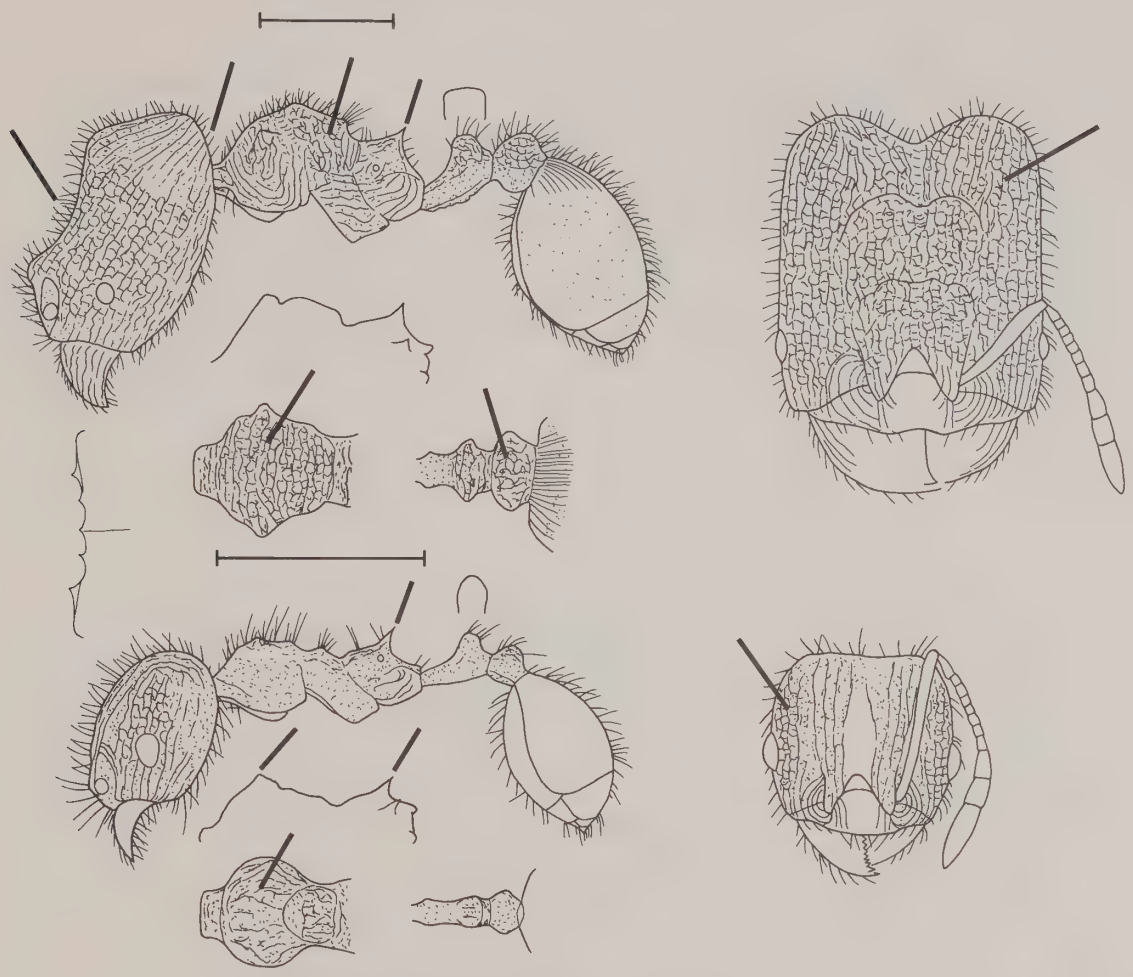


Pheidole reclusi Forel, **new status**

Pheidole distorta r. *reclusi* Forel 1899e: 75.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY Presumably L *reclusa,* shut up, separate, removed.
DIAGNOSIS A member of the *distorta* group distinguished by the following combination of traits.
Major: similar to *distorta* (q.v.) but with less exaggerated promesonotal hump, its rear face descending obliquely rather than vertically to the metanotum in side view; propodeal spines well developed; rugoreticulum of vertex loose, with large, smooth interspaces.
Minor: propodeal spines strongly developed; humerus denticulate in dorsal-oblique view; occipital border in full-face view concave.
MEASUREMENTS (mm) Major (Minca, Colombia): HW 1.78, HL 1.76, SL 0.64, EL 0.16, PW 0.80.
Minor (Minca, Colombia): HW 0.66, HL 0.66, SL 0.62, EL 0.14, PW 0.42.
COLOR Major: bicolorous, with head light reddish brown, rest of body and appendages dark reddish to blackish brown.
Minor: concolorous light brown except for gaster, which is dark brown.
RANGE Recorded from the type locality and near Minca, both in Magdalena, Colombia.
BIOLOGY Unknown.

FIGURE Upper: major (associated with minor compared with lectotype minor), Tucumán, Argentina. Lower: lectotype, minor, Alta Gracia, Córdoba, Argentina. Scale bars = 1 mm.



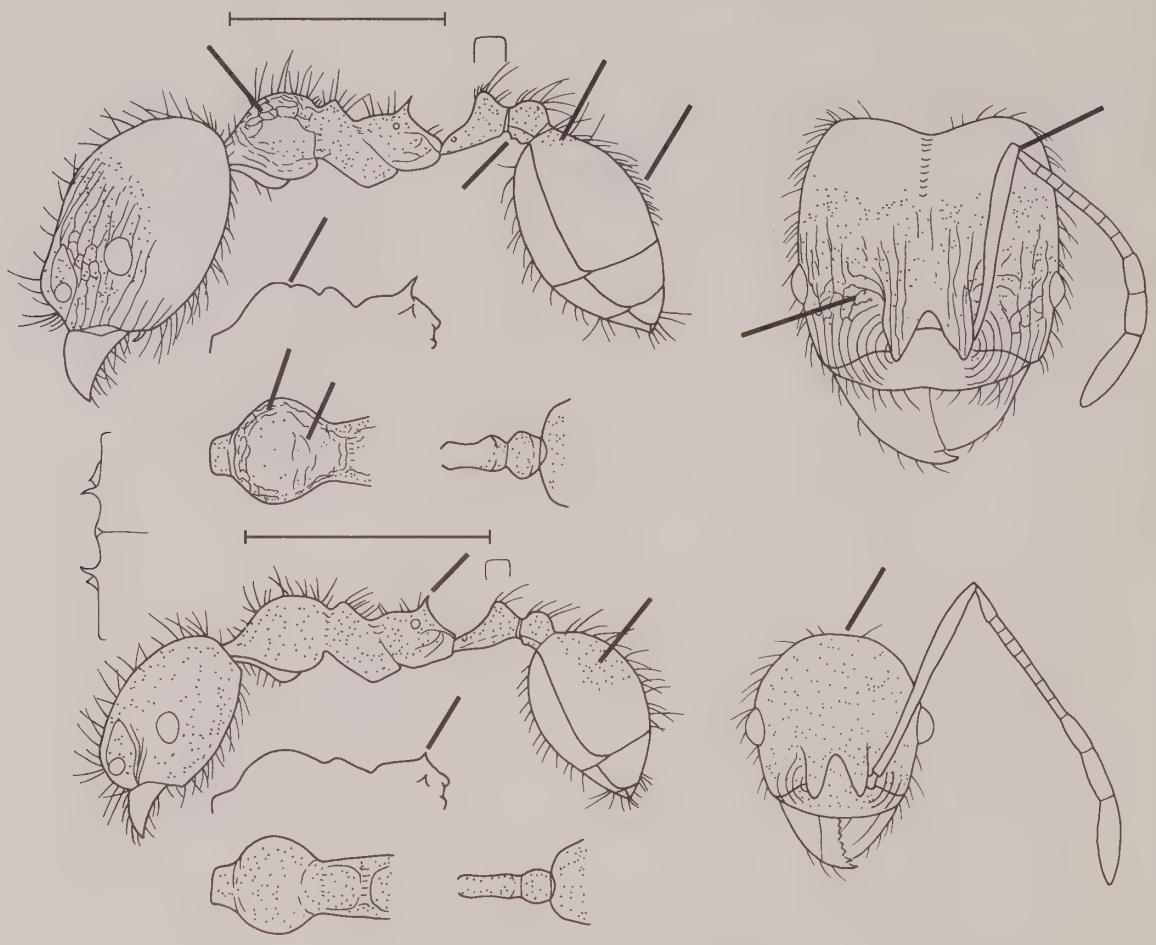
Pheidole scapulata Santschi

Pheidole scapulata Santschi 1923d: 63.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY L *scapula,* pertaining to the shoulder, allusion unknown.
DIAGNOSIS Closest to *monstrosa* and *reclusi,* distinguished from these and other members of the *distorta* group as follows.
Major: entire dorsum of head to the level of the posterior clypeal border of the clypeus completely and densely rugoreticulate; upper fourth of side of head longitudinally carinulate; all but anterior strip of promesonotal dorsum, and all of dorsa of petiolar and postpetiolar nodes rugoreticulate.
Minor: humerus in oblique-dorsal view right-angulate; head heavily sculptured, with extensive rugoreticulum mesad and posterior to eyes; mesonotal dorsum rugoreticulate.
MEASUREMENTS (mm) Major (Tucumán, Argentina)): HW 1.62, HL 1.98, SL 0.74, EL 0.24, PW 1.06.
Lectotype minor: HW 0.80, HL 0.78, SL 0.62, EL 0.16, PW 0.52.
COLOR Major: medium reddish brown (possibly a callow) to dark brown.
Minor: concolorous medium brown except for gaster, which is dark brown.
RANGE Córdoba, Salta, and Tucumán in Argentina; and Santa Cruz in Bolivia.
BIOLOGY Unknown.

Compare with *cielana, cockerelli, dione, hyatti, midas, potosiana*

FIGURE Upper: holotype, major. Lower: paratype, minor. NICARAGUA: Kukra River (Ivette Perfecto). Scale bars = 1 mm.



Pheidole acamata **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *acamata,* untiring, ceaseless.

DIAGNOSIS A member of the *fallax* group, similar to the species listed in the heading above, distinguished by the following combination of traits.

Major: small; yellow; dorsum of first gastral tergite covered by uniform layer of short, subappressed hairs; scape short of the occipital corner by twice its maximum width; a thin corridor of rugoreticulum extending from the eye to the circular carinulae of the antennal fossa; anterior dorsum of the pronotum rugoreticulate, with the rear of the pronotal dorsum bearing broken rugulae and the rest of the promesonotal dorsum shiny or subopaque.

Minor: all of the head, mesosoma, and waist foveolate and opaque; anterior half of the median strip of the first gastral tergite shagreened and opaque; occiput considerably narrowed but lacking a nuchal collar.

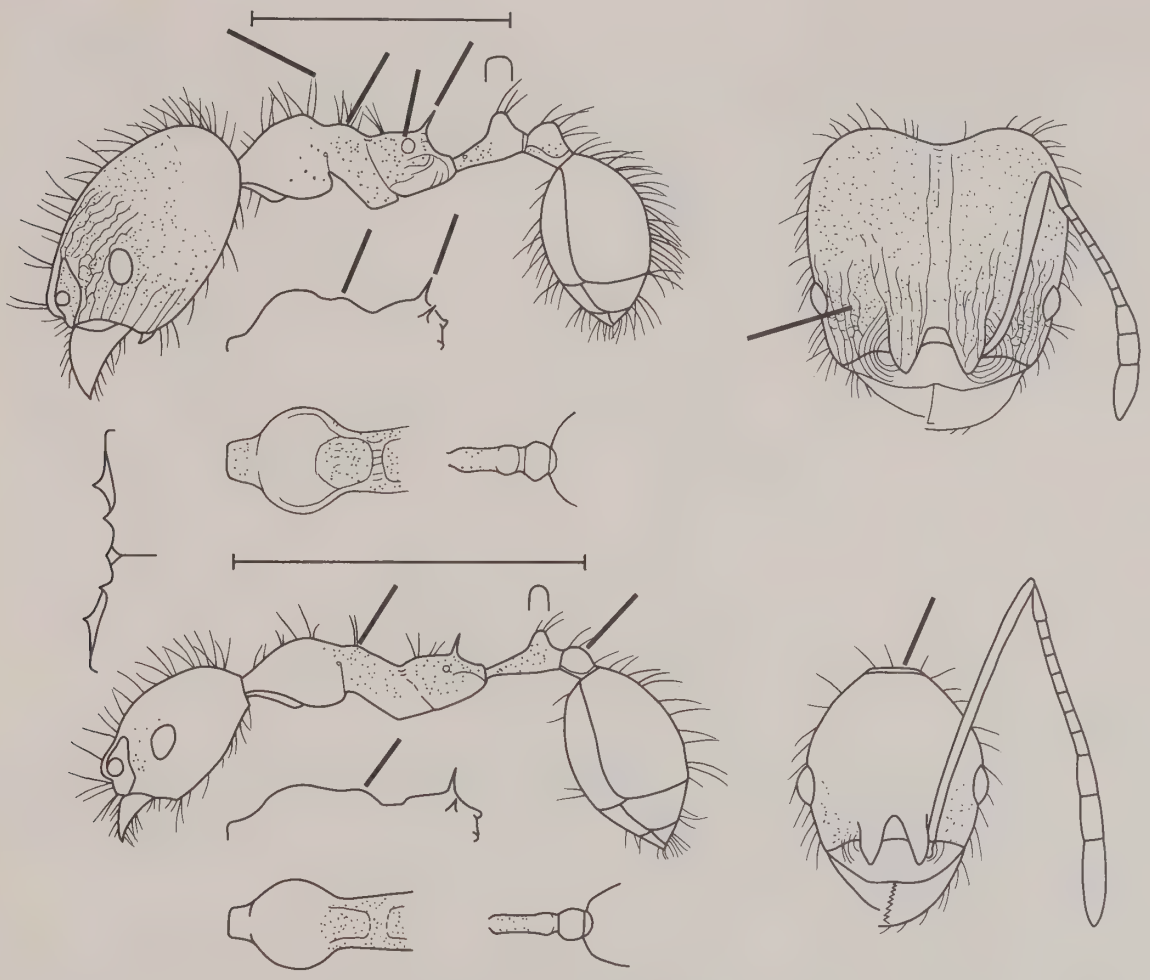
MEASUREMENTS (mm) Holotype major: HW 0.98, HL 1.04, SL 0.76, EL 0.18, PW 0.52.
Paratype minor: HW 0.54, HL 0.60, SL 0.72, EL 0.12, PW 0.38.

COLOR Major: concolorous reddish yellow.
Minor: concolorous dark yellow.

RANGE Known only from the type series.

BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. PANAMA: Nusagandi, San Blas (Leeanne E. Tennant-Alonso). Scale bars = 1 mm.

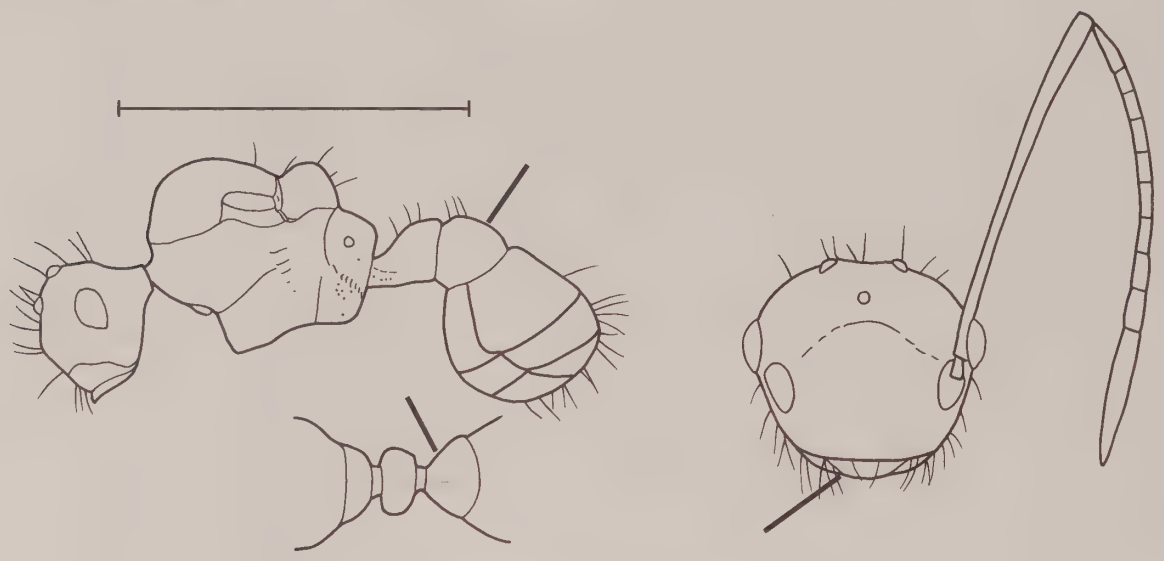


Pheidole aculifera **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *aculifera,* needle-bearing, referring to the long, very thin propodeal spine of the major and minor.
DIAGNOSIS A small, yellow member of the *fallax* group (but close to the *diligens* group) distinguished by the exceptionally thin propodeal spines of the **major** and **minor**, as well as the very low mesonotal convexity in side view in both castes; and, in the **major**, the exceptionally large spiracle.
Similar to *prostrata* of Costa Rica, but easily distinguished in the **major** by the large spiracle, low mesonotal convexity, and presence of a rugoreticulum mesad to the eyes, as well as yellow coloration.
See also the less similar *boruca, variegata,* and *violacea*.
MEASUREMENTS (mm) Holotype major: HW 0.96, HL 1.00, SL 0.78, EL 0.14, PW 0.42.
Paratype minor: HW 0.44, HL 0.54, SL 0.72, EL 0.10, PW 0.28.
COLOR Major: body light reddish yellow, appendages yellow.
Minor: concolorous yellow.
RANGE Known only from the type series.
BIOLOGY Unknown.

Social parasite of *nitidula*

FIGURE Queen. ARGENTINA: La Plata, Buenos Aires (Carlos Bruch). Type locality: Alta Gracia (La Granja). Sierra de Córdoba, Argentina. Scale bar = 1 mm.



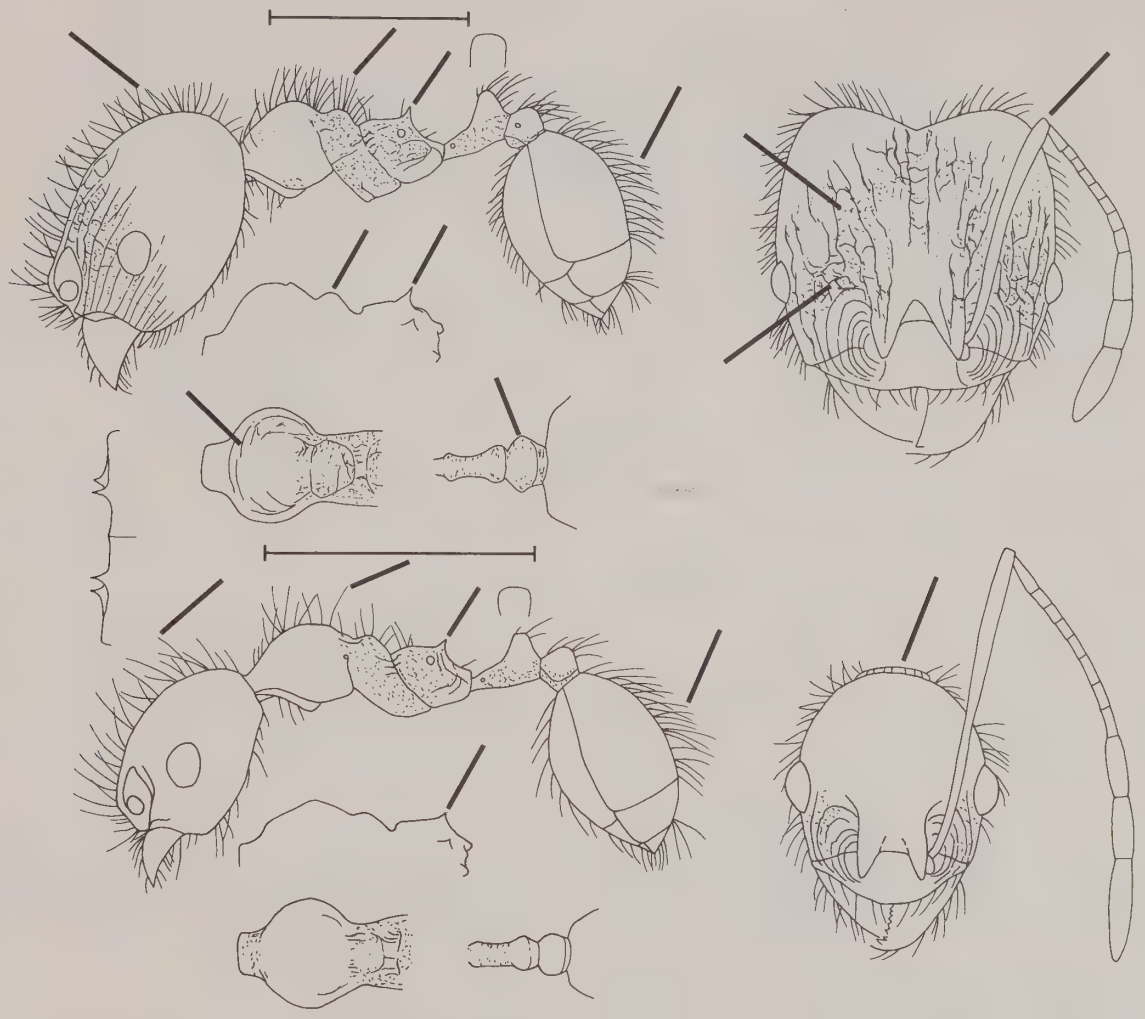
Pheidole acutidens (Santschi)

Bruchomyrma acutidens Santschi 1922e: 249. Combination with *Pheidole* by Wilson 1984b: 327.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY L *acutidens,* sharp-pointed tooth apparently referring to the reduced, acute mandible.
DIAGNOSIS An extreme workerless social parasite of *Pheidole nitidula,* with adaptations that make it unique within the genus.
Queen: with 9- to 11-segmented antennae and minute, falcate toothless mandibles that taper to needle-sharp points.
Male: pupiform, with mandibles vestigial or absent.
MEASUREMENTS (mm) Syntype queen: HW 0.40, HL 0.42, SL 0.72, EL 0.12, PW 0.58.
COLOR Queen: yellowish brown.
RANGE Known only from the type locality.
BIOLOGY *P. acutidens* is a permanent workerless parasite of *Pheidole nitidula*. The discoverer of this remarkable species, Carlos Bruch (1931), has provided extensive notes on its anatomy, ecology, behavior, and life cycle.

Compare with *alienata, bergi, chrysops, cordiceps, midas, nesiota*

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: Utinga Tract, near Belém, Pará (P. F. Darlington). Scale bars = 1 mm.



Pheidole aenescens **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *aenescens,* bronze-like, referring to the body color.

DIAGNOSIS A medium-sized light reddish brown ("coppery") member of the *fallax* group similar to the species listed in the heading above, distinguished by the following combination of traits.

Major: head heart-shaped with extensive, wide-celled rugoreticulum ranging from mesad to the eyes and laterad from the frontal lobes posteriorly to the occiput along the midline, but with the occipital lobes remaining smooth and shiny; pilosity long and very dense over the entire dorsal surface of the body.

Minor: occiput narrowed, with narrow nuchal collar.

In both **major** and **minor** the scapes are covered with long, erect and suberect hairs, not illustrated.

MEASUREMENTS (mm) Holotype major: HW 1.06, HL 1.14, SL 0.94, EL 0.20, PW 0.54.

Paratype minor: HW 0.54, HL 0.70, SL 0.90, EL 0.16, PW 0.40.

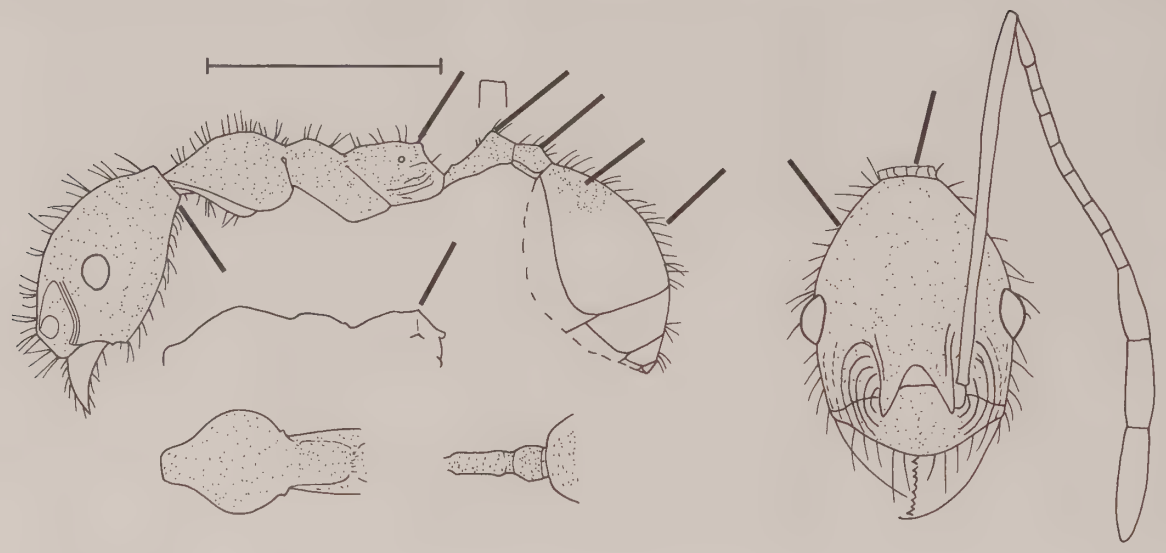
COLOR Major: antennae and body rich light reddish brown ("coppery") except for the gaster, which is plain brown; legs yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

Compare with *gouldi, tolteca*

FIGURE Lectotype, minor. BOLIVIA: San José, Santa Cruz. (Major unknown.) Scale bar = 1 mm.

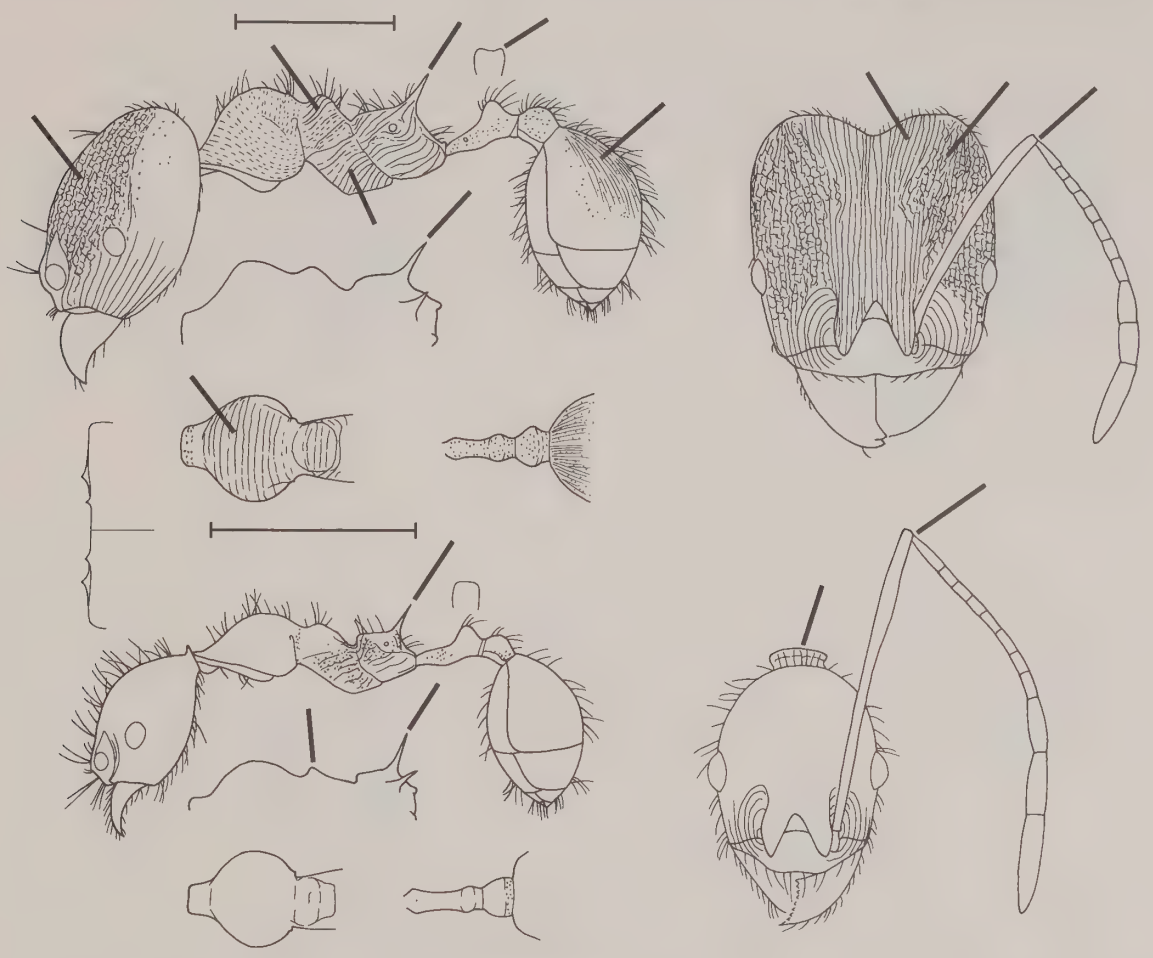


Pheidole aequiseta Santschi

Pheidole aequiseta Santschi 1923d: 57.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY L *aequiseta,* even-haired.
DIAGNOSIS A member of the *fallax* group, with minor similar to that of *gouldi* and *tolteca* (major of *aequiseta* unknown), differing as follows.
Major: unknown.
Minor: slender; occiput drawn into a neck with nuchal collar; propodeal spine reduced to obtuse angle; pilosity over all of body abundant, short, and erect, and of roughly equal length; all of head, mesosoma, and waist foveolate and opaque; anterior third of central strip of first gastral tergite shagreened; petiolar and postpetiolar nodes in side view low; postpetiole as a whole almost cylindrical.
MEASUREMENTS (mm) Lectotype minor: HW 0.60, HL 0.88, SL 1.24, EL 0.20, PW 0.48.
COLOR Minor: concolorous light reddish brown, almost "orange."
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: major. Lower: minor. COSTA RICA: Rio Toro Amarillo, near Guapiles (William L. Brown). Minor compared with syntype in Museum d'Histoire Naturelle, Genève, by W. O. Brown. Type locality: San José, Costa Rica. Scale bars = 1 mm.



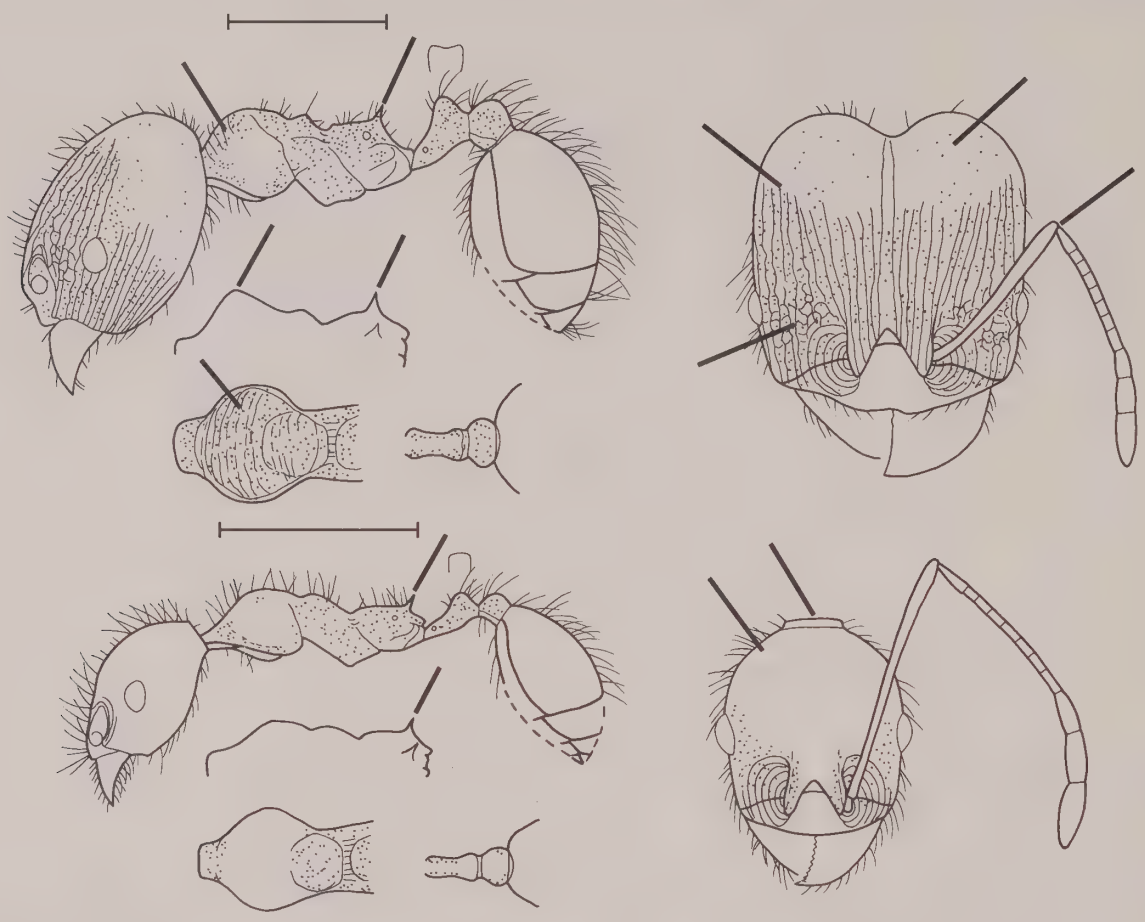
Pheidole ajax Forel

Pheidole ajax Forel 1899e: 71.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY Gr *Ajax,* legendary Greek hero of the Trojan war.
DIAGNOSIS A large brown member of the *fallax* group immediately recognizable in the **major** by the extremely long propodeal spines; by the completely carinulate center of the head and frontal lobes, which is flanked by a rugoreticulum on either side in full-face view; and by the striate first gastral tergite.
Minor: extremely long propodeal spines and mostly smooth and shiny head and body.
Similar to *fiorii, hector, jaculifera,* and *lourothi,* differing in many details of body form, sculpturing, and pilosity, as depicted.
MEASUREMENTS (mm) Major (Rio Toro Amarillo, Costa Rica): HW 1.28, HL 1.36, SL 1.16, EL 0.22, PW 0.66.
Minor (Rio Toro Amarillo, Costa Rica): HW 0.56, HL 0.82, SL 1.12, EL 0.14, PW 0.40.
COLOR Major: body dark brown, appendages medium brown.
Minor: body and most appendages medium to light brown, except for yellowish brown tarsi.
RANGE Atlantic slope to 600 m (J. T. Longino 1997).
BIOLOGY A nest was found by Longino (1997) beneath the bark of a rotten stump in mature wet forest.

Compare with *aenescens, bergi, cordiceps, chrysops, midas, nesiota*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Guanabara, Rio de Janeiro. Scale bars = 1 mm.

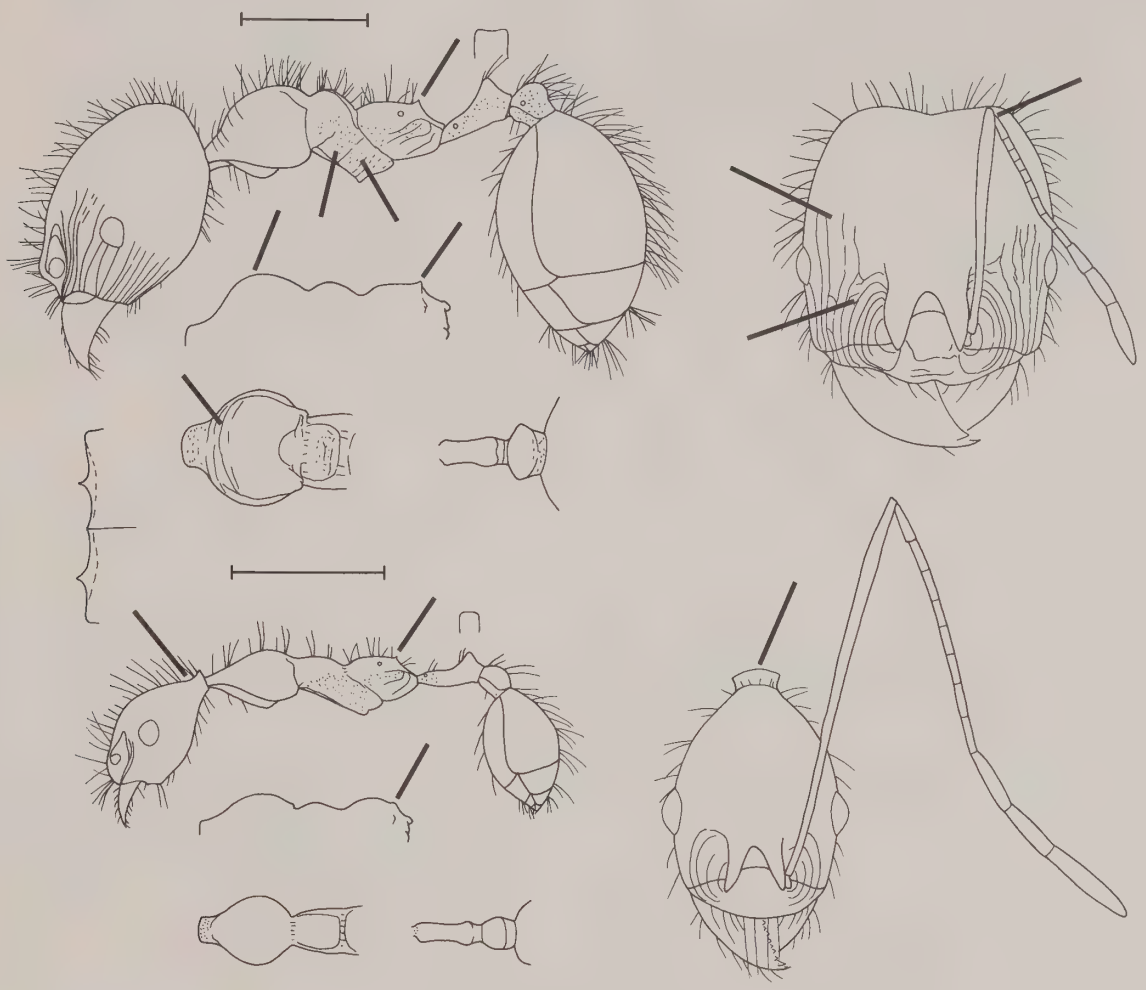


Pheidole alienata Borgmeier, **new status**

Pheidole bergi subsp. *alienata* Borgmeier 1929: 205.

TYPES Mus. Zool. Univ. São Paulo.
ETYMOLOGY L *alienata,* estranged, maddening; allusion unknown.
DIAGNOSIS A member of the *fallax* group, close to *bergi* and possibly only a variant of it; also similar to *aenescens, cordiceps, chrysops, midas,* and *nesiota*. *P. alienata* is distinguished as follows.
Major: carinulae of dorsum of head extend more than halfway from level of eye to occiput; pronotum completely covered by transverse carinulae, and foveolate and opaque in the interspaces; humerus in dorsal-oblique view prominent, rising 2× higher above the level of the propodeum as the mesonotal convexity.
Minor: propodeal spine long, needle-like.
MEASUREMENTS (mm) Lectotype major: HW 1.52, HL 1.60, SL 0.94, EL 0.22, PW 0.78.
Paralectotype minor: HW 0.68, HL 0.84, SL 1.00, EL 0.18, PW 0.48.
COLOR Major: concolorous light reddish brown.
Minor: appendages and body brownish yellow except for the gaster, which is plain medium brown.
RANGE Known only from the type locality.
BIOLOGY Unknown.

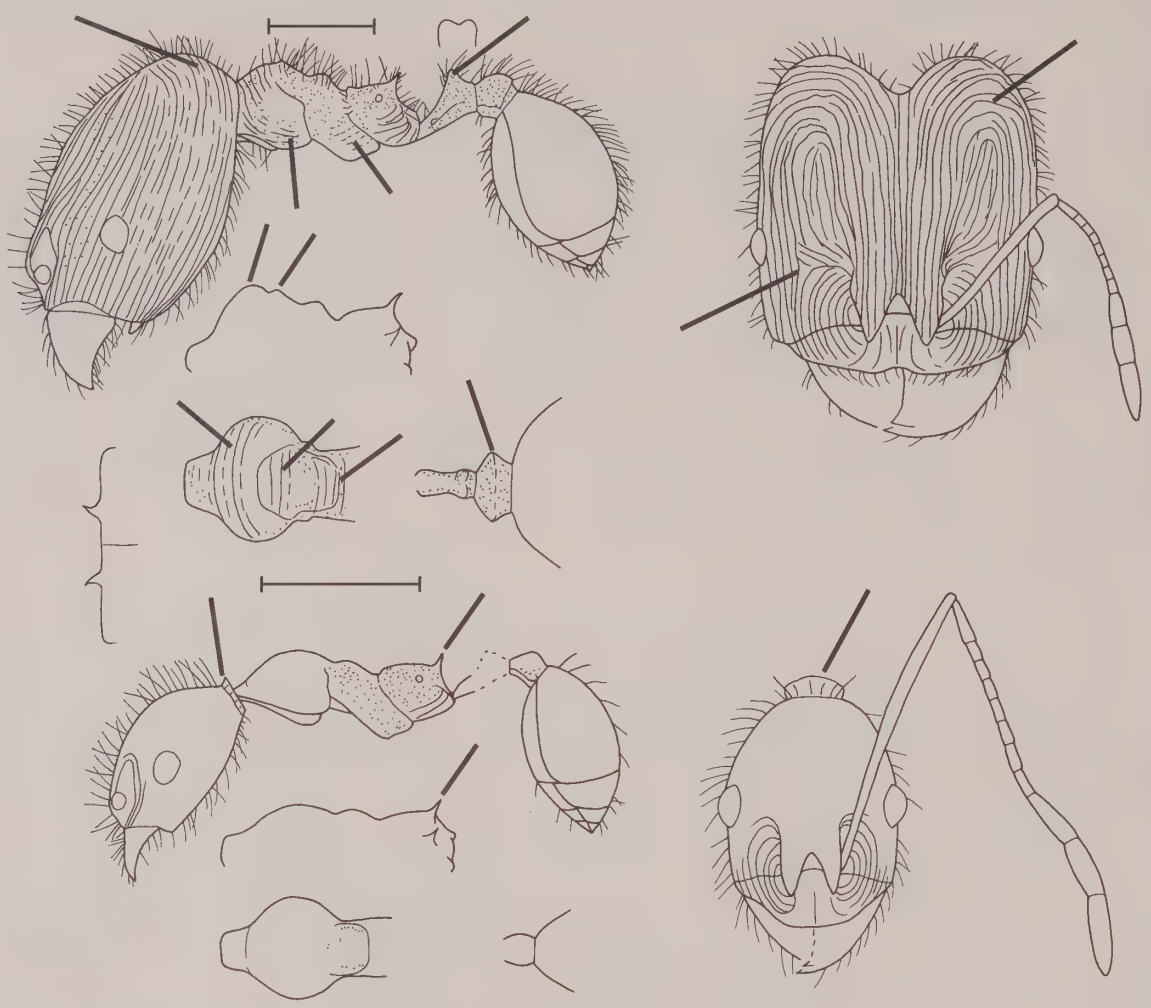
FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: S. Norte, Carajás, Pará (C. Roberto F. Brandão and W. W. Benson). Scale bars = 1 mm.



Pheidole araneoides **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *araneoides,* resembling a spider.
DIAGNOSIS A large, relatively thin and long-legged member of the "*jujuyensis* complex" of the larger *fallax* group, comprising *araneoides, cuevasi, durionei, jujuyensis, kugleri, leonina, leptina, lucretii, lupus, paraensis, punctithorax, tijucana, wallacei,* and *wolfringi*. *P. araneoides* is distinguished by the following combination of traits.
Major: scape just reaches occipital angle; carinulae reach midpoint of cephalic capsule, and very small rugoreticular patches are present laterad to the circular carinulae of the antennal fossae; humerus smoothly rounded in dorsal-oblique view; propodeal spines reduced to denticles.
Minor: occiput drawn out into a neck with nuchal collar; body almost completely smooth and shiny; propodeal spines reduced to denticles.
Close to *chocoensis* and *wallacei,* also from Amazonian Brazil, differing in details of the characters cited above.
MEASUREMENTS (mm) Holotype major: HW 1.70, HL 1.84, SL 1.44, EL 0.26, PW 0.90.
Paratype minor: HW 0.64, HL 1.02, SL 1.62, EL 0.20, PW 0.50.
COLOR Major: mandibles and gaster dark reddish yellow to light reddish brown; rest of body and appendages medium reddish yellow.
Minor: concolorous dark yellow.
RANGE Amazonas and Pará states, Brazil.
BIOLOGY Found in lowland rainforest.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Pirapora, Minas Gerais. Scale bars = 1 mm.

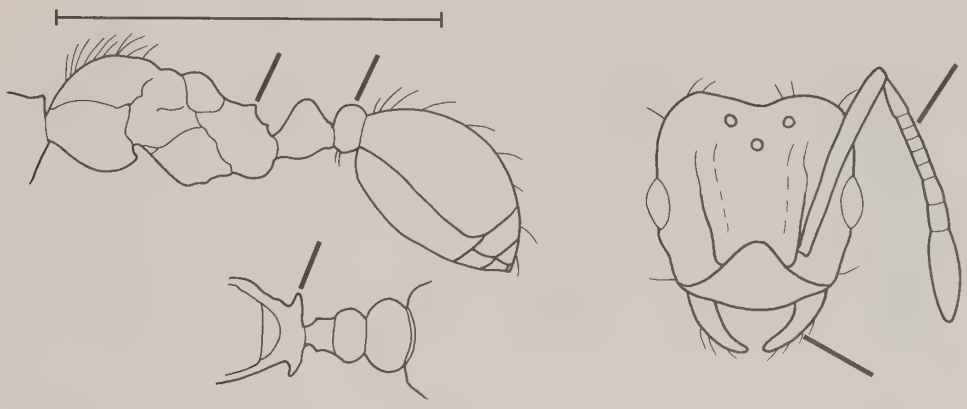


Pheidole arcifera Santschi

Pheidole arcifera Santschi 1925d: 226.

TYPES Mus. Zool. Univ. São Paulo.
ETYMOLOGY L *arcifera,* bow-carrier, referring to the unique cephalic carinulae.
DIAGNOSIS A large member of the *fallax* group, uniquely defined as follows.
Major: entire head carinulate, with carinulae originating on the frontal lobes turning laterad as they approach the occiput, then forward to return all the way to the anterior edge of the head capsule; promesonotum mostly carinulate, with carinulae on the anterior half of the pronotum curving down to run along the ventral border of the pronotum; in dorsal-oblique view, pronotal profile bilobate; in side view, apex of petiolar node tapered to a point; postpetiolar node diamond-shaped and foveolate.
Minor: occiput tapered to a neck, with a broad nuchal collar; propodeal spines thin, needle-like.
MEASUREMENTS (mm) Lectotype major: HW 2.00, HL 2.24, SL 1.20, EL 0.32, PW 1.00.
Paralectotype minor: HW 0.70, HL 0.96, SL 1.26, EL 0.20, PW 0.50.
COLOR Major and minor: rich medium reddish brown, appendages brownish yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Syntype, queen. (Adapted from Bruch 1932.) ARGENTINA: Alta Gracia (La Granja), Sierra de Córdoba (Carlos Bruch). Scale bar = 1 mm.

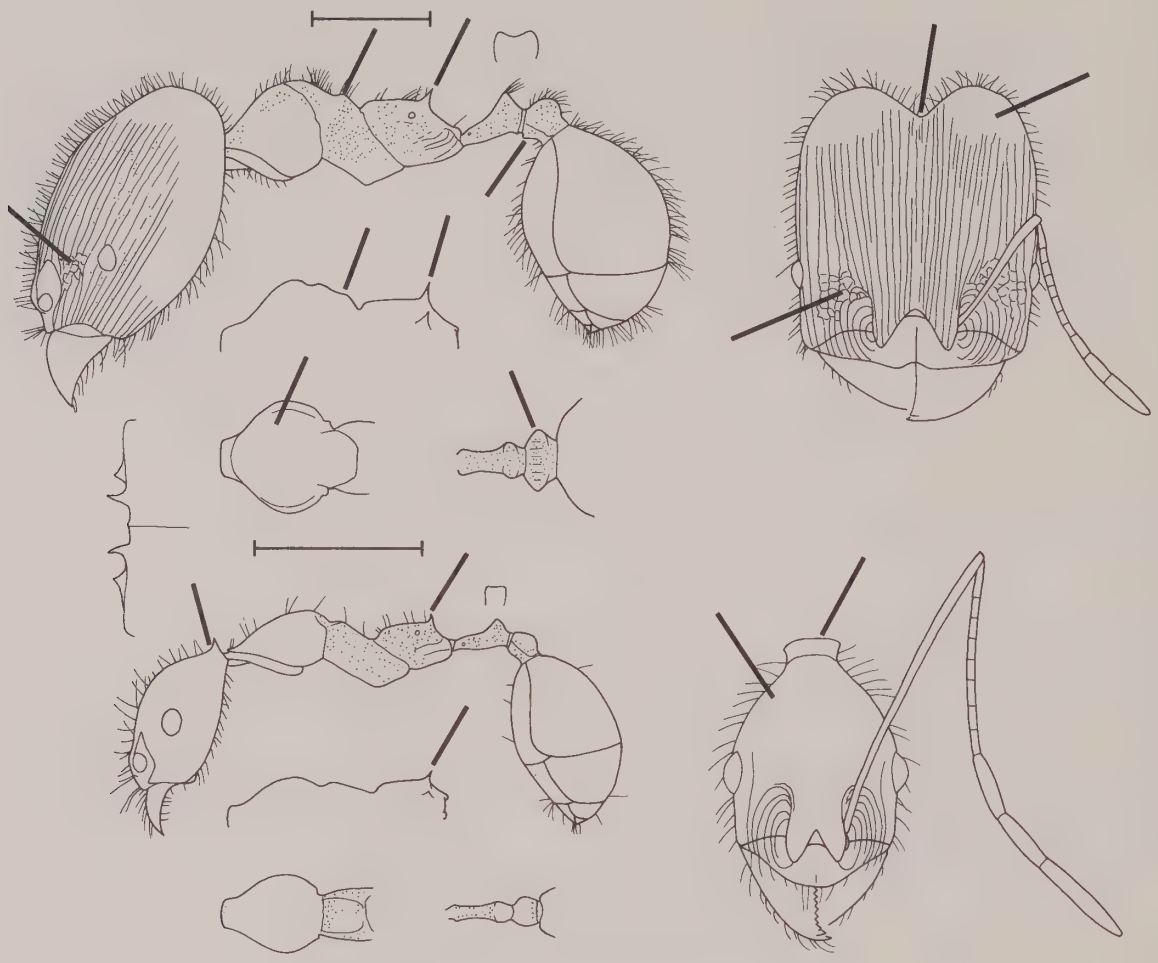


Pheidole argentina (Bruch)

Gallardomyrma argentina Bruch 1932: 273. Placed in *Pheidole* by generic synonymy *(Pheidole = Gallardomyrma)* by W. L. Brown 1973b: 180.

TYPES Mus. La Plata, Buenos Aires.
ETYMOLOGY Named after the country of origin.
DIAGNOSIS An extreme workerless parasite of *Pheidole nitidula*. The queen possesses a trait unique within the ants: the antenna is 10-segmented, with a well-developed, 1-segmented club. Also, the body is somewhat pupiform and the mandibles are reduced to toothless straps.
MEASUREMENTS (mm) Syntype queen: according to Bruch (1932), the total length of a queen in the type series is 1.7 mm.
COLOR Head, especially vertex, brownish yellow; mesosoma, waist, and gaster (except the apex) grayish brown..
RANGE Known only from the type locality.
BIOLOGY A permanent workerless parasite of *Pheidole nitidula*.

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios (Stefan Cover and John E. Tobin). Scale bars = 1 mm.



Pheidole astur **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *astur,* hawk.

DIAGNOSIS A member of a complex of *Pheidole* species with giant majors covered by short, bristly hair, in the larger *fallax* group, comprising *astur, oxyops, praeusta,* and *trageri*. *P. astur* is distinguished among them by the following combination of traits.

Major: a patch of rugoreticulum present laterad to each antennal fossa; longitudinal carinulae immediately next to the dorsal midline of head reaches the occipital border, but the occipital lobes are smooth and shiny; postpetiolar node seen from above elliptical in shape, with subangular lateral margins; small subpostpetiolar process present.

Minor: occiput narrowed to form a distinct neck, followed by a broad nuchal collar; pronotum entirely smooth and shiny.

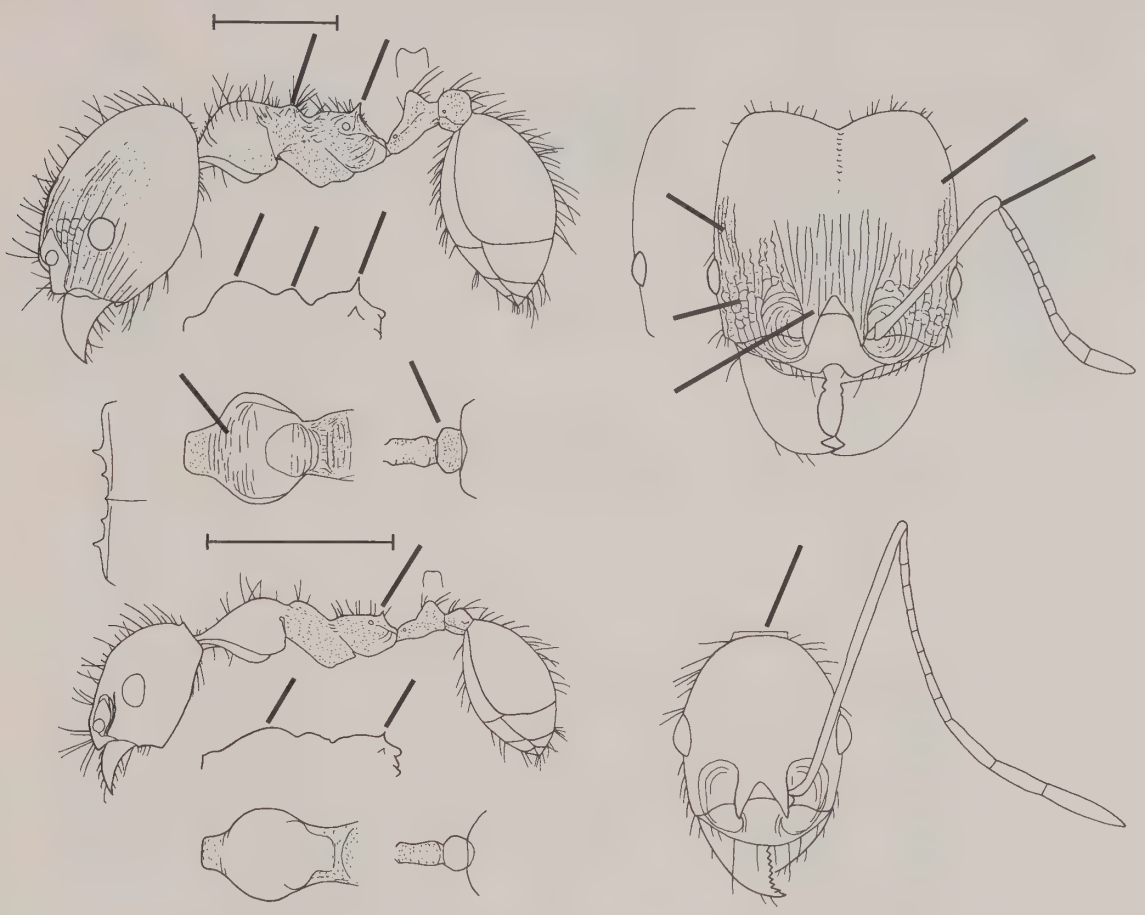
MEASUREMENTS (mm) Holotype major: HW 2.34, HL 2.66, SL 1.20, EL 0.30, PW 1.10.
Paratype minor: HW 0.68, HL 1.04, SL 1.42, EL 0.20, PW 0.50.

COLOR Major: body and mandibles reddish brown, legs and antennae a lighter shade of reddish brown.
Minor: concolorous yellow.

RANGE I have examined material of *astur* from French Guiana, Suriname, and Colombia, as well as Amazonian Ecuador, Peru, and Bolivia.

BIOLOGY This large species occurs in lowland rainforest over a wide part of South America. At Cuzco Amazónico, near Puerto Maldonado, Peru, Stefan Cover (unpublished collection notes) reports colonies nesting in soil, and minors foraging on the surface of soil and leaf litter.

FIGURE Upper: major (compared with syntype major, and the left profile of the head belongs to the syntype). Lower: minor. ARGENTINA: Cafayate, Salta. (Type locality: Buenos Aires, Argentina.) Scale bars = 1 mm.

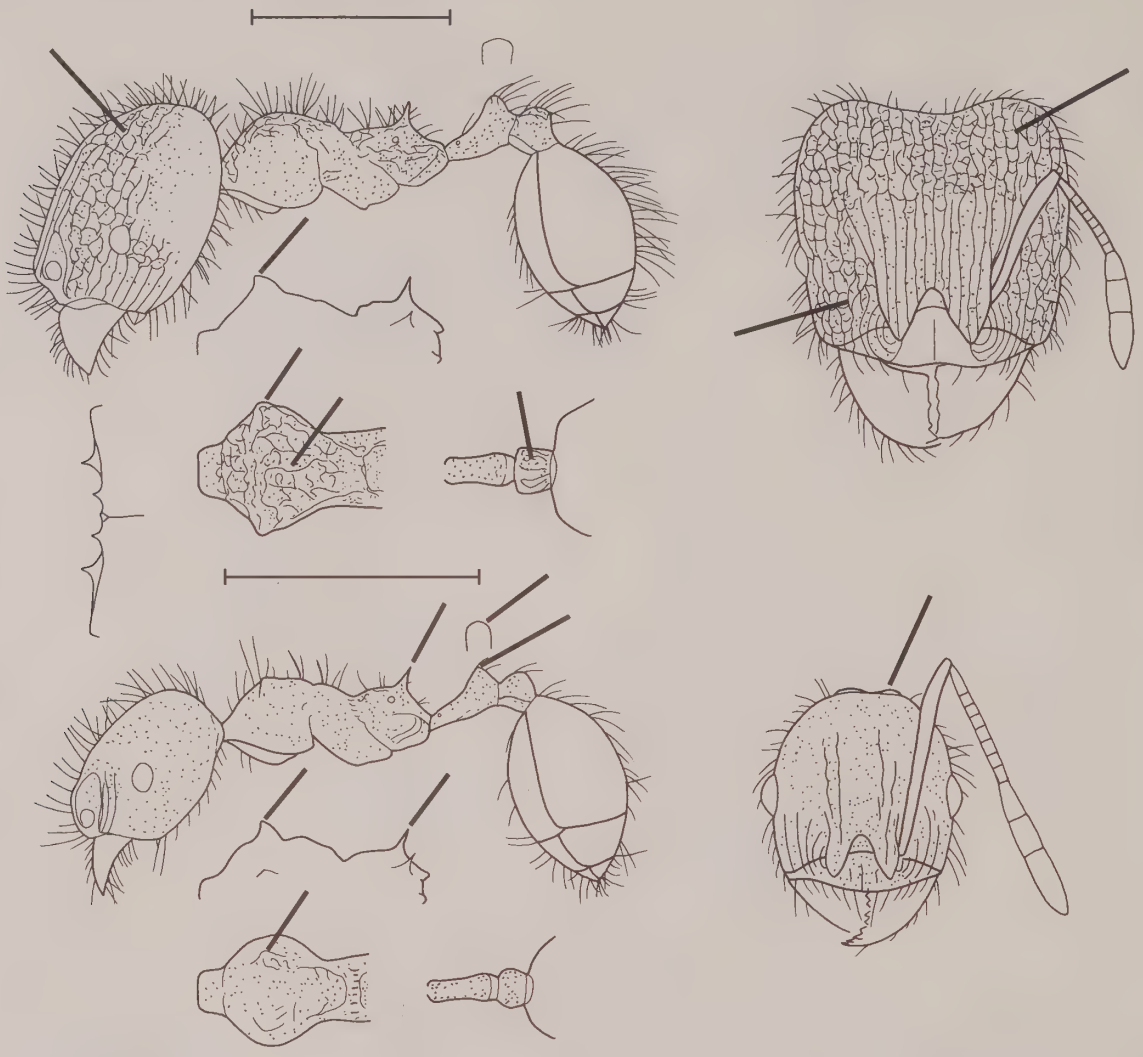


Pheidole bergi Mayr

Pheidole bergi Mayr 1887: 593, 605. Syn.: *Pheidole bergi* subsp. *subparallela* Emery 1906c: 145, n. syn.; *Pheidole bergi* st. *pulliventris* Santschi 1929d: 288, n. syn.; *Pheidole goetschi* Santschi 1939e: 314, placed as *bergi goetschi* by Kusnezov 1952d: 67, n. syn. Raised to species level in this monograph: *alienata*.

TYPES Naturhist. Mus. Wien; Mus. Comp. Zool. Harvard.
ETYMOLOGY Eponymous.
DIAGNOSIS A medium-sized reddish brown (major) or brownish yellow (minor) member of the *fallax* group distinguished as follows.
Major: head subquadrate; propodeal spine moderately long and suberect; postpetiolar node from above roughly trapezoidal; mesonotal convexity prominent and symmetrical in shape in both side and dorsal-oblique views; rugoreticulum extends as a broad band from the eye to the circular carinulae of the antennal fossa; frontal lobes completely covered by longitudinal carinulae; carinulae mesad to the eye reach halfway between the eye and the occipital border.
Minor: occiput narrow, with nuchal collar; humerus smoothly rounded in dorsal-oblique view. Similar to *aenescens, alienata, chrysops, cordiceps, dentata, dione, eidmanni, midas,* and *nitidula,* differing in many details as described and illustrated.
MEASUREMENTS (mm) Syntype major: HW 1.94 (Cafayate, Argentina, major has HW 1.54), HL 2.08, SL 1.12, EL 0.32, PW 0.96. Minor (Cafayate): HW 0.56, HL 0.80, SL 1.10, EL 0.16, PW 0.38.
COLOR Major: body mostly light reddish brown; terminal gastral segments medium reddish brown.
Minor: concolorous brownish yellow.
RANGE Uruguay, and widespread through Argentina, from Jujuy and Santa Fé in the north to Rio Negro in the south.
BIOLOGY Bruch (1916) describes *bergi* as an abundant, widespread species in Argentina. It builds conspicuous soil nests, each with a single entrance hole 2–3 cm in diameter, often surrounded by a crater or partially by a semicircle of excavated soil as much as 25 cm in diameter. A single gallery descends to a succession of 5 to 10 roughly ellipsoidal chambers, each spaced about equally apart, and reaching a depth of 40–60 cm. The colonies are aggressive, with a high proportion of majors, and exclusively insectivorous. They readily attack other colonies of their own and other ant species.

FIGURE Upper: holotype, major. Lower: paratype, minor. PANAMA: Barro Colorado Island (Alfred E. Emerson). Scale bars = 1 mm.



Pheidole caltrop **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY ML *caltrop,* a four-pointed weapon placed on the ground to impede movement.

DIAGNOSIS A unique member of the *fallax* group characterized as follows.

Major: yellow; occiput, genae, and promesonotal dorsum rugoreticulate; large "sharkfin" protrusion on humerus extends beyond the boundaries of the rest of the pronotum when viewed from above; dorsum of postpetiolar node carinulate.

Minor: large "sharkfin" angle protrudes from humerus; all of body except gaster foveolate and opaque; very thin nuchal collar present.

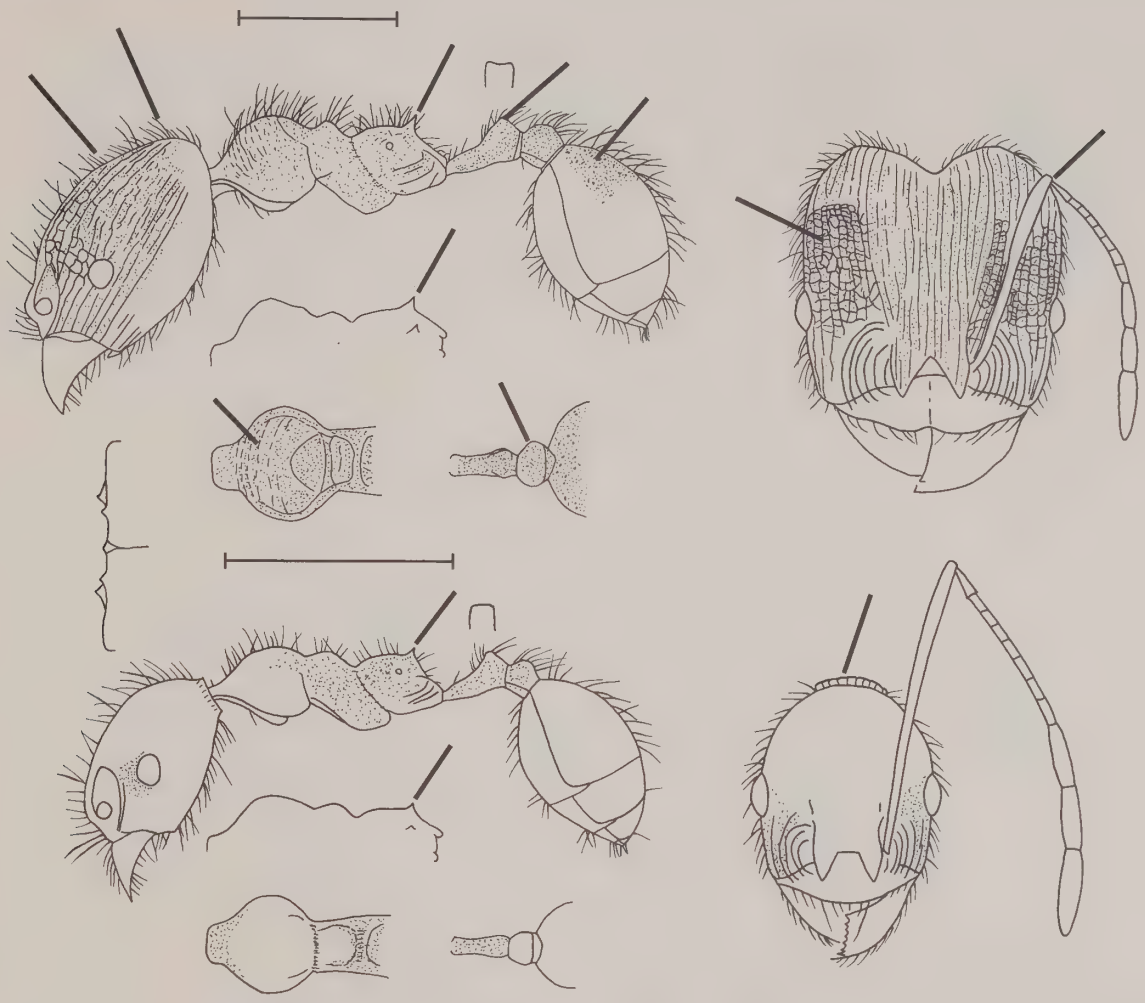
MEASUREMENTS (mm) Holotype major: HW 1.22, HL 1.18, SL 0.64, EL 0.14, PW 0.62.
Paratype minor: HW 0.60, HL 0.66, SL 0.66, EL 0.10, PW 0.42.

COLOR Major: concolorous dark yellow.
Minor: concolorous medium yellow.

RANGE Known only from the type locality.

BIOLOGY "From large thorns hollowed out on living tree" (A. E. Emerson, collection note 13 April 1935).

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: Serra Caraça, Minas Gerais, 1380 m (K. Lenko). Scale bars = 1 mm.

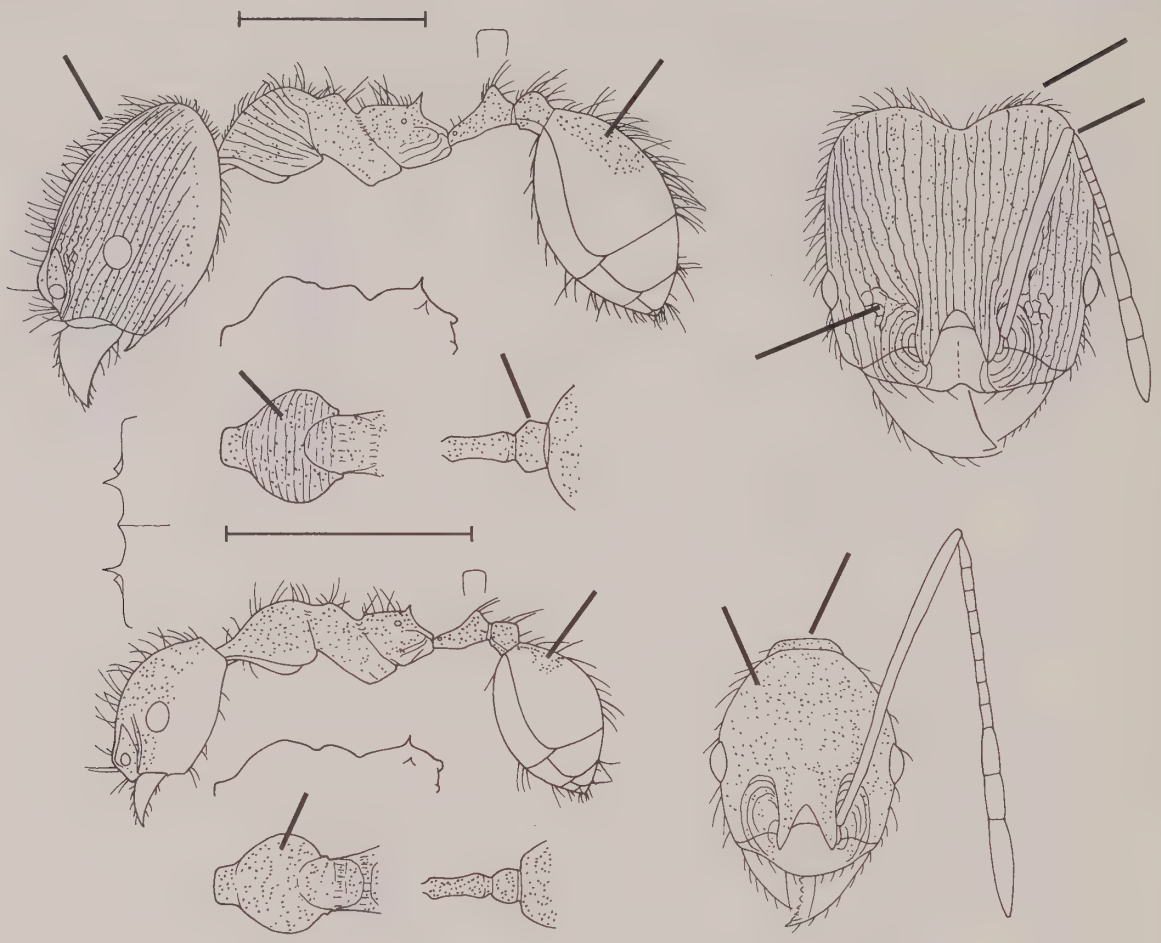


Pheidole cardinalis **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *cardinalis,* red.
DIAGNOSIS A member of the *fallax* group, closest to *caribbaea, kukrana, mantilla, obscurior,* and *rubiceps* (also scan *alienata, fallax, jelskii, laniger, lattkei, lovejoyi, petrensis, puttemansi, roushae, susannae, tobini*), distinguished by the following combination of traits.
Major: brownish red, with yellow appendages; pilosity of posterior dorsal profile of head a mix of dense, uniform, medium-length semierect hairs and sparse, much longer erect hairs; occiput, frontal lobes, and vertex carinulate; area between eye and vertex rugoreticulate; the tip of the antennal scape comes to within a distance equal to the maximum scape width of the occipital border; shagreened and opaque.
Minor: nuchal collar present; propodeal spines reduced to denticles.
MEASUREMENTS (mm) Holotype major: HW 1.40, HL 1.50, SL 1.04, EL 0.22, PW 0.66.
Paratype minor: HW 0.52, HL 0.74, SL 0.94, EL 0.14, PW 0.66.
COLOR Major: body medium brownish red ("brick red") except for genae anterior to eyes, which, along with the appendages, are reddish yellow.
Minor: body concolorous light brown; appendages yellowish brown.
RANGE Known only from the type locality.
BIOLOGY The type colony came from an earthen nest.

Compare with *cardinalis, kukrana, mantilla, obscurior, rubiceps*

FIGURE Upper: syntype, major. Lower: syntype, minor. JAMAICA: Balaclava. Scale bars = 1 mm.

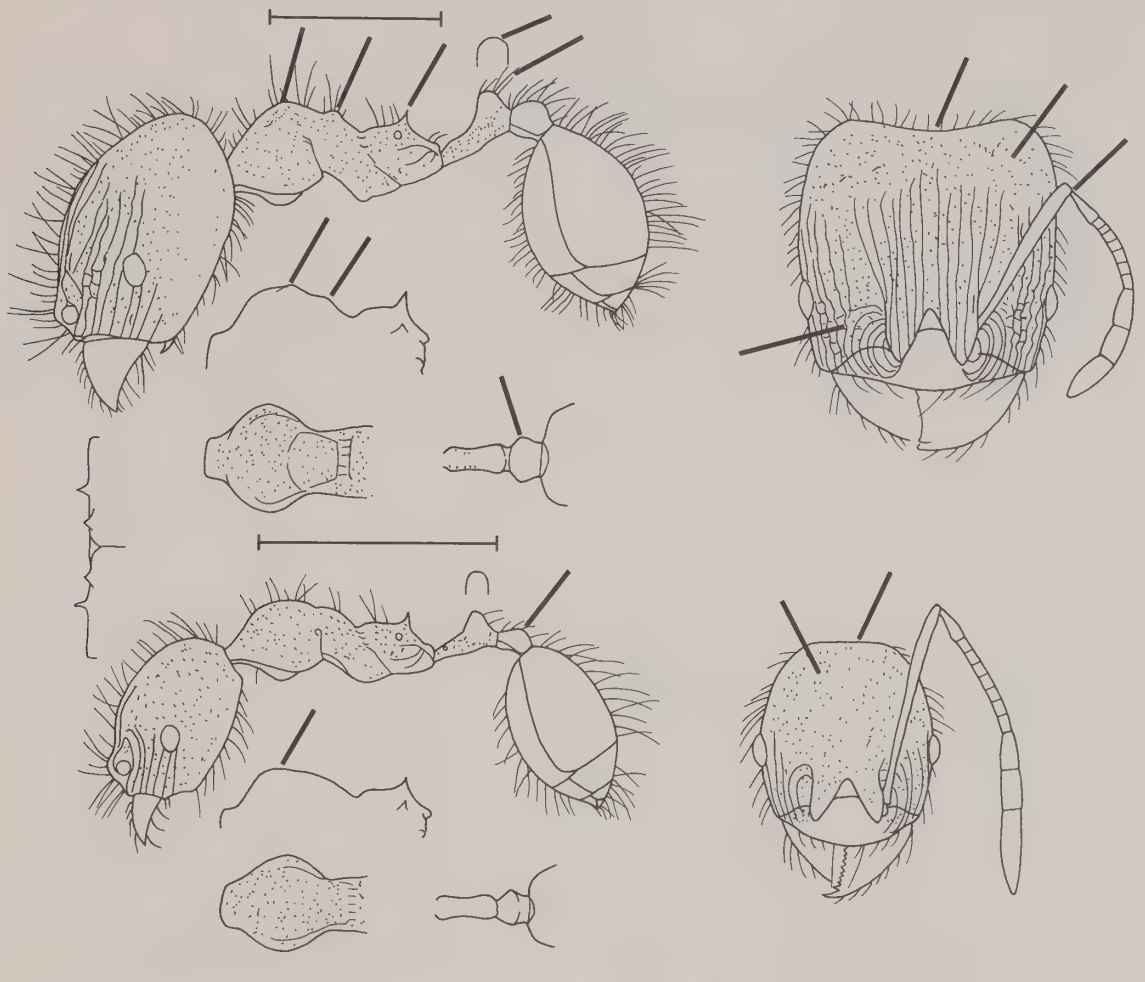


Pheidole caribbaea Wheeler

Pheidole caribbaea Wheeler 1911a: 23. Syn.: *P. caribbaea* subsp. *sloanei* Wheeler 1917g: 459, n. syn.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Refers to region of origin.
DIAGNOSIS A brown member of the *fallax* group whose **major** has the dorsal surface of the head completely covered with longitudinal parallel carinulae, except the extreme occipital strip (seen in full-face view), which is smooth and shiny; pronotum and anterior mesonotum completely covered with transverse carinulae; postpetiolar node trapezoidal; anterior half of the first gastral tergite shagreened; and head densely covered with mostly erect to suberect hairs.
Close to *mantilla* of Costa Rica and *kukrana* of Nicaragua but differing in details of head shape, sculpture, pilosity, and color (q.v.); see also *cardinalis, obscurior, rubiceps*.
MEASUREMENTS (mm) Syntype major: HW 1.12, HL 1.20, SL 0.96, EL 0.20, PW 0.58.
Syntype minor: HW 0.52, HL 0.66, SL 0.92, EL 0.14, PW 0.34.
COLOR Major: head medium brown, mesosoma dark brown, waist and gaster medium to dark brown, appendages light to medium brown.
Minor: body concolorous medium brown, appendages medium to yellowish brown.
RANGE Known only from Jamaica, an apparent endemic.
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: 5 km east of Rayón, Chiapas, 1700m, 17°13′N 92°58′W (Philip S. Ward). Scale bars = 1 mm.

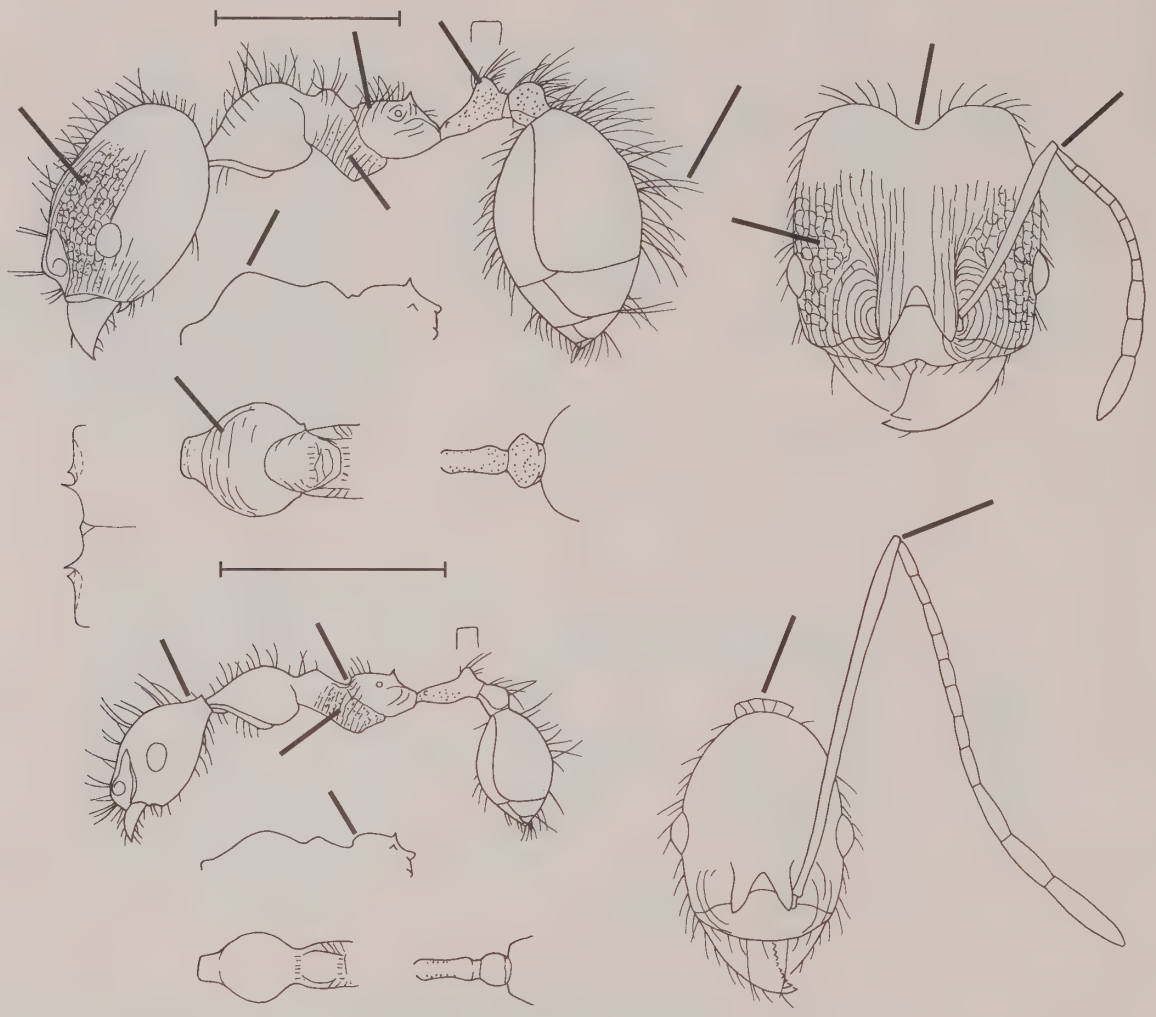


Pheidole chiapasana **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the Mexican state of origin.
DIAGNOSIS A member of the *fallax* group, similar in various characters to the species listed in the heading above, especially *laevivertex* and *tetroides,* and distinguished as follows.
Major: entire head and mesosoma foveolate and opaque; mesosoma and postpetiolar node low; pronotal dorsal profile broken only slightly by a very low convexity; humerus low and rounded; postpetiole roughly diamond-shaped; rugoreticulum of head limited to a band between eye and antennal fossa; occiput weakly concave.
Minor: entire head and mesosoma foveolate and convex; postpetiolar node very low, the entire postpetiole cylindrical in side view; occiput narrowed, its margin flat; propodeal spines directed strongly upwards.
MEASUREMENTS (mm) Holotype major: HW 1.21, HL 1.32, SL 0.82, EL 0.16, PW 0.62.
Paratype minor: HW 0.58, HL 0.66, SL 0.70, EL 0.10, PW 0.40.
COLOR Major: body light brown, legs yellowish brown.
Minor: head and mesosoma dark brown, waist and gaster medium brown except for tarsi, which are light brown.
RANGE Known from the type locality and from Lagos de Montebello, Chiapas, at 1500 m.
BIOLOGY At Rayón, in leaf litter of montane rainforest, and at Lagos de Montebello, in leaf litter of mixed tropical and temperate mesic forest (P. S. Ward).

Compare with *araneoides, wallacei*

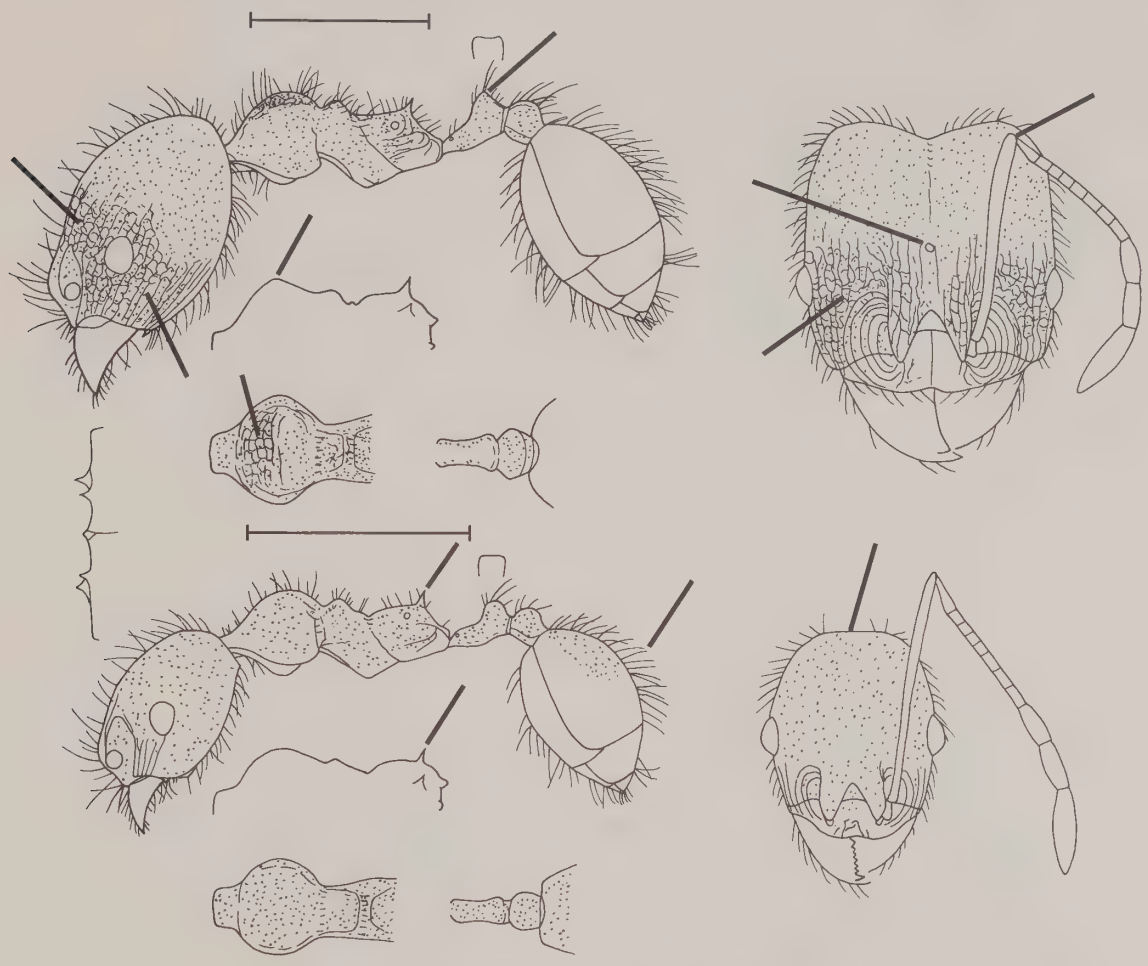
FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Finca Los Guaduales, 10 km southwest of José del Palmar, Rio Torito, Chocó, 760 m (Charles Kugler). Scale bars = 1 mm.



Pheidole chocoensis **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the region of the type locality.
DIAGNOSIS A small, yellow member of the *fallax* group similar to *araneoides* and *wallacei,* and easily distinguished as follows.
Major: extensive rugoreticulation covers the space between the eye to the frontal carinae and circular carinulae of the antennal fossae; head roughly quadrate, occiput deep; antennal scapes fall short of the occipital lobes by 2× the scapes' maximal width; mesopleuron and dorsal face of propodeum carinulae; pilosity dense and very long.
Minor: neck and nuchal collar well-developed; basal face of propodeum drops vertically in front to metanotum; mesopleuron carinulate.
MEASUREMENTS (mm) Holotype major: HW 1.18, HL 1.24, SL 1.00, EL 0.20, PW 0.62.
Paratype minor: HW 0.46, HL 0.66, SL 0.98, EL 0.14, PW 0.34.
COLOR Major: concolorous medium reddish yellow.
Minor: concolorous medium yellow.
RANGE Known only from the type locality.
BIOLOGY The type series was collected from a forested mountain slope. A winged queen was present 1–4 June.

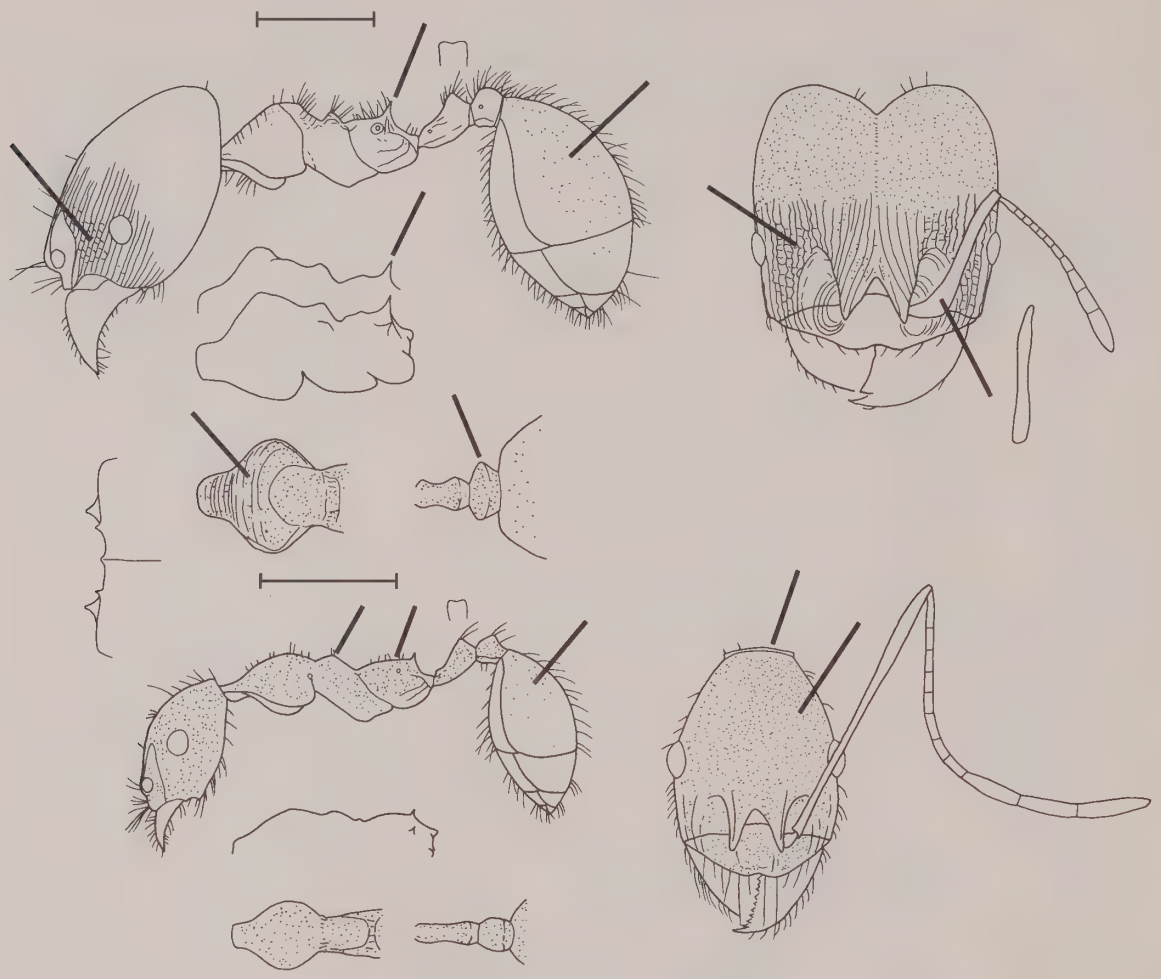
FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: Rancho Cielo, 17 km northwest of Gomez Farias, Tamaulipas, 1160 m (Philip S. Ward). Scale bars = 1 mm.



Pheidole cielana **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the type locality.
DIAGNOSIS A member of the *fallax* group distinguished by the following combination of traits.
Major: medium-sized; reddish brown; median ocellus present; entire body covered by dense, erect to suberect hairs; scape approaches the occipital corner by less than its own width; extensive rugoreticula occur around the eyes and on the frontal lobes; anterior half of pronotal dorsum and all of mesonotal dorsum rugoreticulate.
Minor: all of head, mesosoma, and waist foveolate and opaque, and anterior half of median strip of first gastral tergite shagreened and opaque.
MEASUREMENTS (mm) Holotype major: HW 1.14, HL 1.22, SL 0.96, EL 0.20, PW 0.60.
Paratype minor: HW 0.64, HL 0.74, SL 0.96, EL 0.16, PW 0.44.
COLOR Major: body and most of head medium reddish brown, appendages and sides of head anterior to eye light reddish brown.
Minor: overall medium reddish brown, tarsi yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: major; the antennal scape viewed edge-on is depicted next to the frontal view of the head; the upper of the two dorsal-oblique views is of a syntype major. Lower: minor. BRAZIL: Anápolis, Goiás (W. Kempf). Compared with syntypes. (Type locality: Pirapora, Minas Gerais, Brazil.) Scale bars = 1 mm.

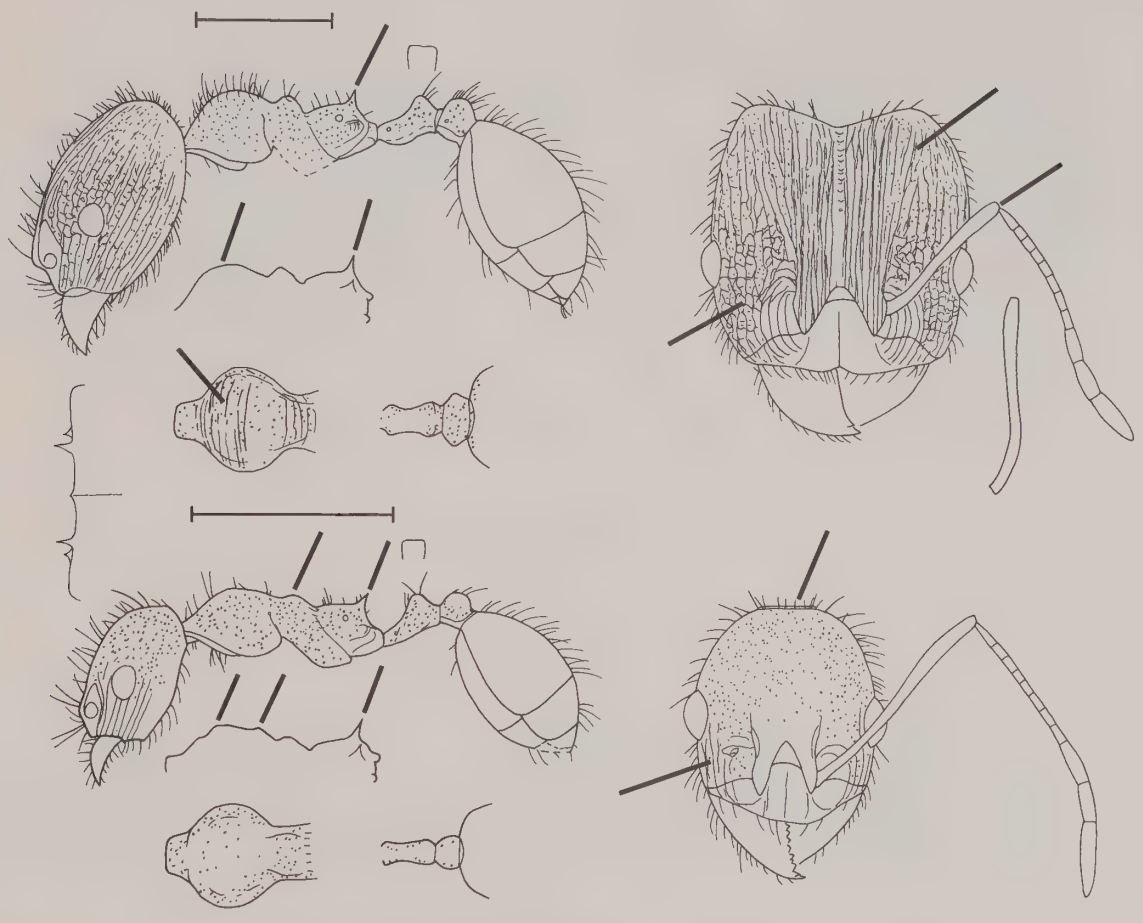


Pheidole claviscapa Santschi

Pheidole claviscapa Santschi 1925d: 224.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY L Gr *claviscapa,* "club stem," referring to the swollen and somewhat flattened base of the antennal scape.
DIAGNOSIS One of the giant Neotropical species, comparable in size to *cephalica* and *fimbriata* of the *tristis* group (q.v.).
Major: very large, Head Width about 2.1 mm; antennal scape broadly swollen and flattened at base; space between eye and antennal fossa rugoreticulate; entire median strip of gaster shagreened.
Minor: head in full-face view elliptical in outline, with nuchal crest; entire head, except frontal triangle, and mesosoma and waist foveolate and opaque; anterior half of first gastral tergite shagreened.
MEASUREMENTS (mm) Major (Anápolis, Brazil): HW 2.10, HL 2.24, SL 1.20, EL 0.26, PW 1.04.
Minor (Anápolis, Brazil): HW 0.80, HL 1.04, SL 1.36, EL 0.20, PW 0.62.
COLOR Major and minor: reddish yellow ("orange") or reddish brown.
RANGE Recorded from Minas Gerais, Goiás, Mato Grosso, and Ceará by Kempf (1972b). I have seen in addition a series from Santa Cruz, eastern Bolivia (P. S. Ward).
BIOLOGY The preferred habitat is evidently *cerrado,* the tropical savanna of central South America.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. NEW MEXICO: Arroyo Pecos, Las Vegas (T. D. A. Cockerell and W. M. Wheeler). Scale bars = 1 mm.

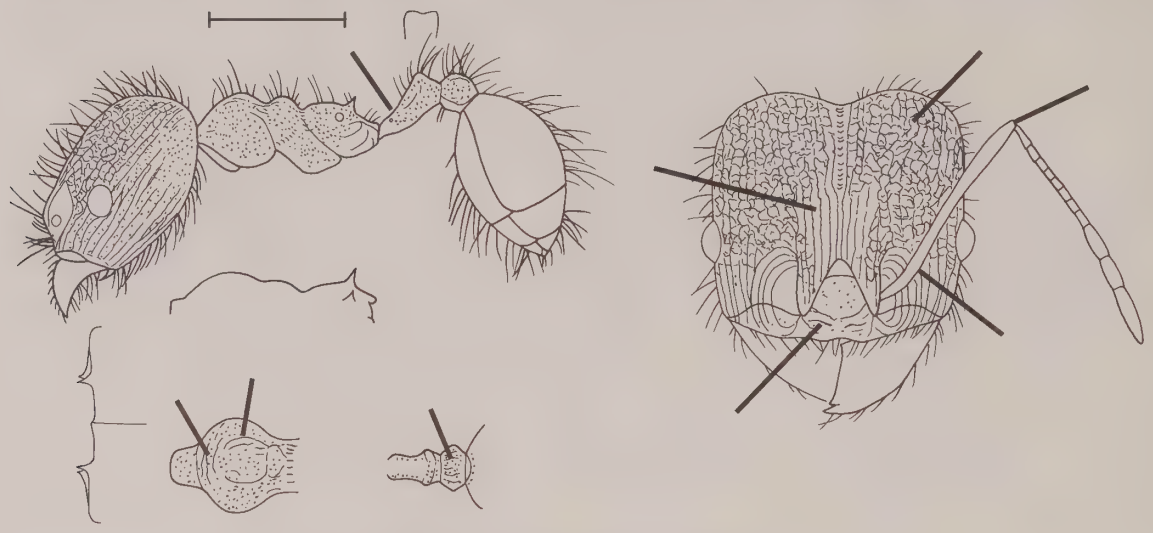


Pheidole cockerelli Wheeler

Pheidole cockerelli Wheeler 1908h: 464.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the American entomologist and co-collector of the type series T. D. A. Cockerell.
DIAGNOSIS A member of the *fallax* group distinguished by the following combination of traits.
Major: light reddish brown; a rugoreticulum extends from around the anterior and posterior margins of each eye mesad to the circular carinulae of the antennal fossa; longitudinal carinulae densely covering the frontal lobes extend posteriorly to the occipital border; anterior half of pronotal dorsum and posterior half of the mesonotum transversely carinulate; all of the head, mesosoma, and waist foveolate and opaque to subopaque except the dorsum of the petiole, which, with the gaster, is smooth and shiny.
Minor: all of the head and mesosoma foveolate and opaque; dorsum of the waist and all of the gaster smooth and shiny; occiput narrowed, with a thin collar.
Similar to *acamata, cielana,* and *sciara,* as well as the other species listed in the heading, differing in many details in the above characters and others as illustrated. Most likely to be confused with *sciara,* a less common species that occurs through much of the range of *cockerelli*.
MEASUREMENTS (mm) Lectotype major: HW 1.38, HL 1.50, SL 1.02, EL 0.24, PW 0.74.
Paralectotype minor: HW 0.62, HL 0.78, SL 0.90, EL 0.18, PW 0.44.
COLOR Major: concolorous light reddish brown, except rear half of gaster, which is a contrasting medium brown.
Minor: concolorous yellowish brown.
RANGE Oklahoma, Colorado, western Texas, New Mexico, Arizona.
BIOLOGY In Colorado, Gregg (1963) found *cockerelli* nesting at 1700–1900 m, under rocks in the clayey soil of short-grass prairie. Creighton (1950a) lists it as a desert ant in Arizona and New Mexico. Stefan Cover (personal communication) found it in the Chiricahua, Huachuca, and Santa Maria Mts. of Arizona at 1460–1740 m nesting in open soil and grass clumps variously in desert grassland, grazed grasslands with scattered oak, and juniper-oak creek-valley woodland. In western Texas, O. F. Francke encountered *cockerelli* in a nest in the open soil of mesquite-creosote-cactus scrubland (Mus. Comp. Zool. Harvard series). Winged reproductives were present in Arizona nests from late June to mid-July.

FIGURE Lectotype, major. MEXICO: Jalapa, Veracruz (F. Silvestri). (Minor unknown.) Scale bar = 1 mm.

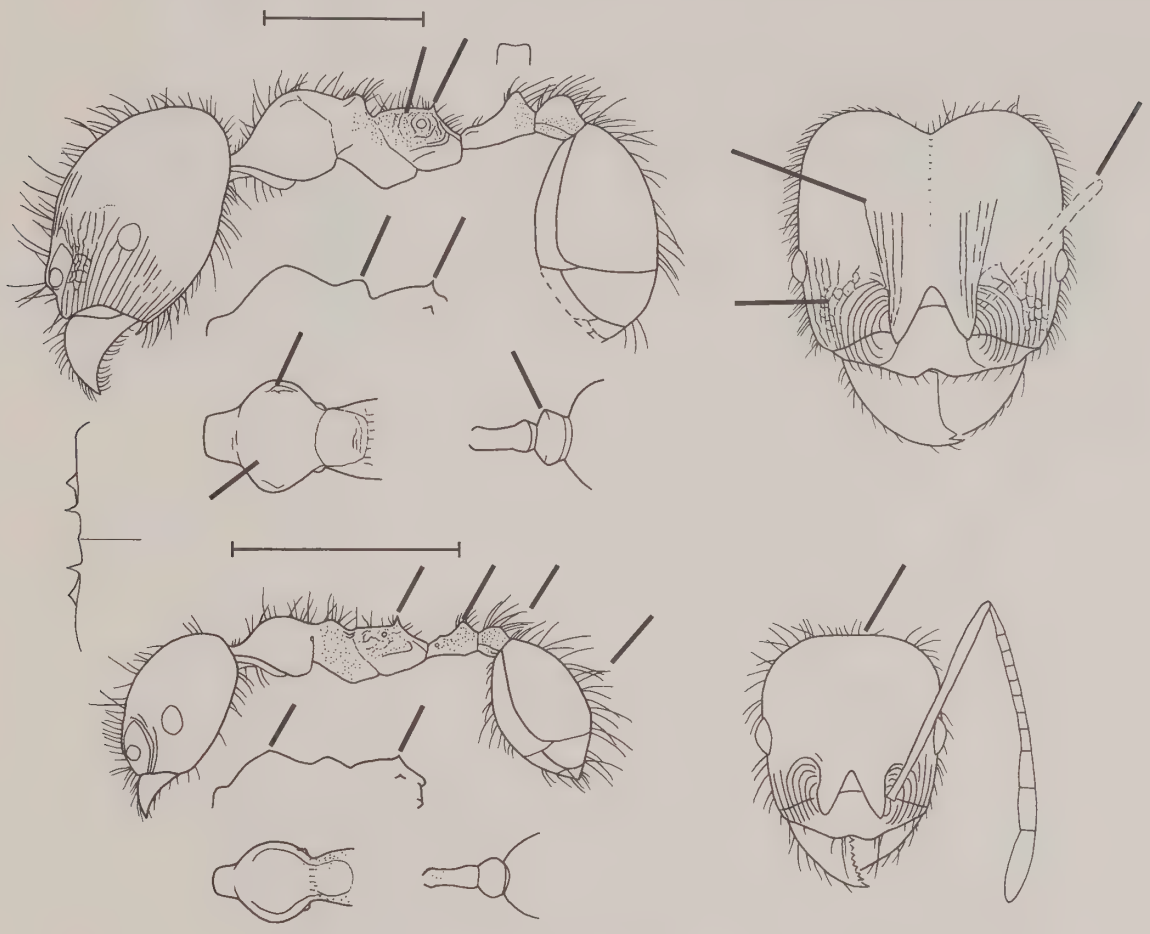


Pheidole confoedusta Wheeler

Pheidole confoedusta Wheeler 1909b: 233.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Unknown.
DIAGNOSIS A member of the *fallax* group, easily distinguished as follows.
Major: antennal scape exceeding occipital corner by about its own maximum width; vertex and genae carinulate, and sides of dorsum of head from level of ventral eye margin to occiput rugoreticulate; head quadrate; antennal scapes expanded near base; petiolar peduncle in side view very thick, its dorsal profile forming a straight line with the node all the way to the apex; parts of pronotal dorsum and mid-clypeus irregularly rugulose; entire head, mesosoma, and waist foveolate and opaque; postpetiole from above diamond-shaped and carinulate.
Minor: unknown.
MEASUREMENTS (mm) Lectotype major: HW 1.30, HL 1.26, SL 1.04, EL 0.24, PW 0.70.
COLOR Major: concolorous light reddish brown.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: lectotype, major (antennal scape drawn from an undamaged paralectotype major). Lower: paralectotype, minor. ARGENTINA: Buenos Aires (P. de Strobel). Scale bars = 1 mm.



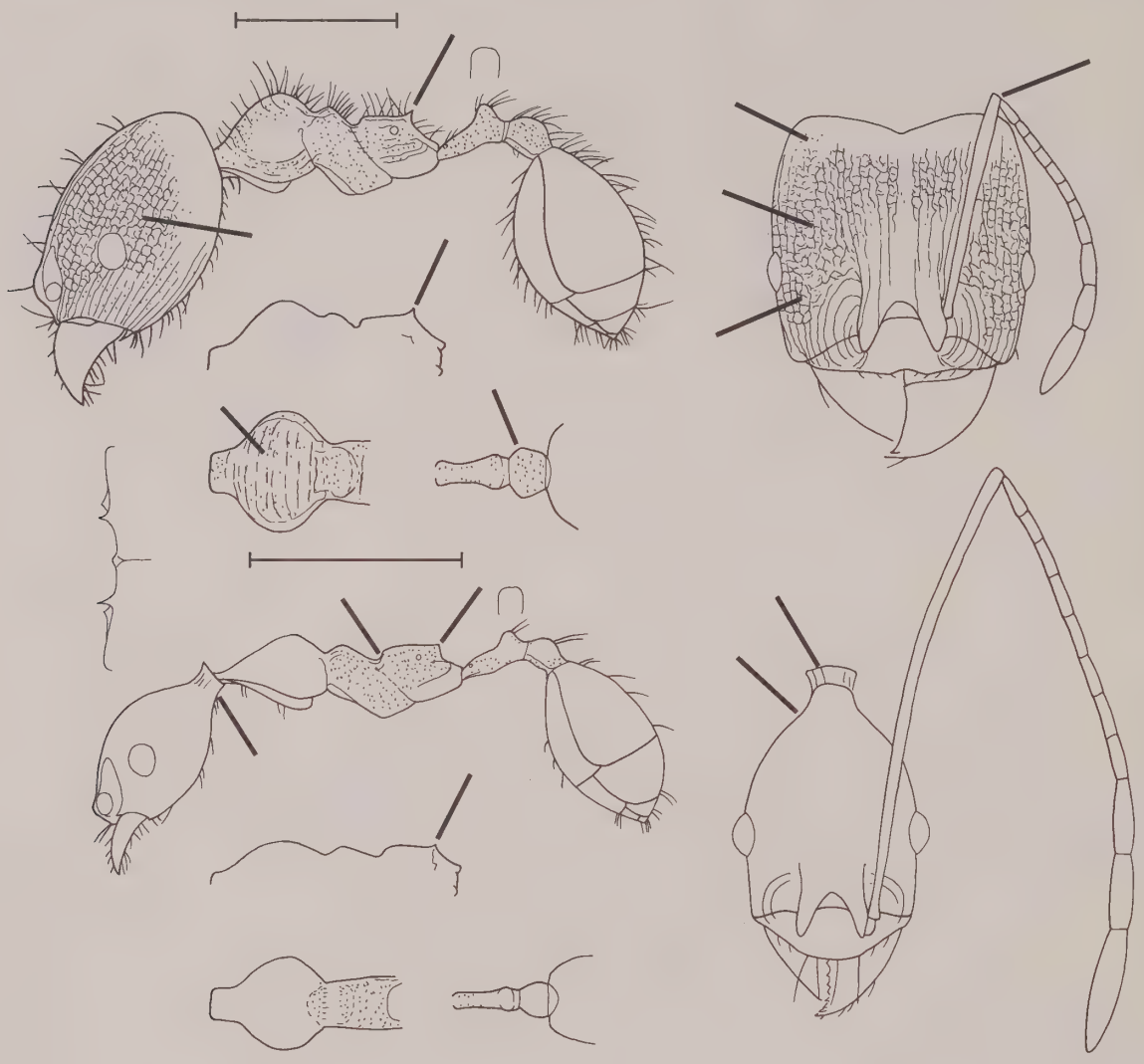
Pheidole cordiceps Mayr

Pheidole cordiceps Mayr 1868b: 174. Syn.: *Pheidole cordiceps* var. *lilianae* Forel 1912g: 232, n. syn.

TYPES Naturhist. Mus. Wien.
ETYMOLOGY L *cordiceps,* heart-shaped head.
DIAGNOSIS A medium-sized, yellow member of the *fallax* group, distinguished as follows:
Major: head heart-shaped; propodeal spines reduced to denticles; postpetiolar node seen from above roughly trapezoidal; mesonotal convexity prominent, and in dorsal-oblique view seeming to "lean" posteriorly; carinulae on frontal lobes restricted to lateral halves, and rest of cephalic sculpturing confined to the level of the eyes and capsule anterior to them.
Minor: occiput very broad, lacking nuchal collar; humerus angulate; sculpturing on head limited to anterior fourth of dorsal surface. Most similar to and possibly synonymous with *dione*.
MEASUREMENTS (mm) Lectotype major: HW 1.44, HL 1.46, SL not measured, EL 0.22, PW 0.72.
Paralectotype minor: HW 0.70, HL 0.74, SL 0.86, EL 0.16, PW 0.42.
COLOR Major: medium yellow, gaster a slightly contrasting yellowish brown.
Minor: head and mesosoma reddish yellow, waist and gaster medium brown.
RANGE Argentina: widespread in the country, including Buenos Aires, Chabut, Córdoba, Mendoza, and Salta (Kempf 1972b).
BIOLOGY Unknown.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios (Stefan Cover and John E. Tobin). Scale bars = 1 mm.



Pheidole cuevasi **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after John de Cuevas, friend, author, and field companion.

DIAGNOSIS A member of the "*jujuyensis* complex" of the larger *fallax* group, comprising *araneoides, cuevasi, durionei, jujuyensis, kugleri, leonina, leptina, lucretii, lupus, paraensis, punctithorax, tijucana, wallacei,* and *wolfringi,* which complex is characterized in both major and minor by slender body form and exceptionally long antennal scapes and petiolar pedicels; also in the major by a proportionately small head; and in the minor by a strongly developed nuchal collar. *P. cuevasi* is distinguished as follows.

Major: rugoreticulum covering all the dorsal surface of the head except the occipital lobes, frontal lobes, and middle of clypeus; antennal scapes just reach the occipital corners; pronotal dorsum partly covered by transverse carinulae; first gastral tergite entirely smooth and shiny.

Minor: occipital neck extremely drawn out, and nuchal collar prominent; propodeal spines reduced to denticles.

Both castes reddish yellow.

MEASUREMENTS (mm) Holotype major: HW 1.56, HL 1.62, SL 1.32, EL 0.22, PW 0.80.

Paratype minor: HW 0.60, HL 1.04, SL 1.58, EL 0.20, PW 0.44.

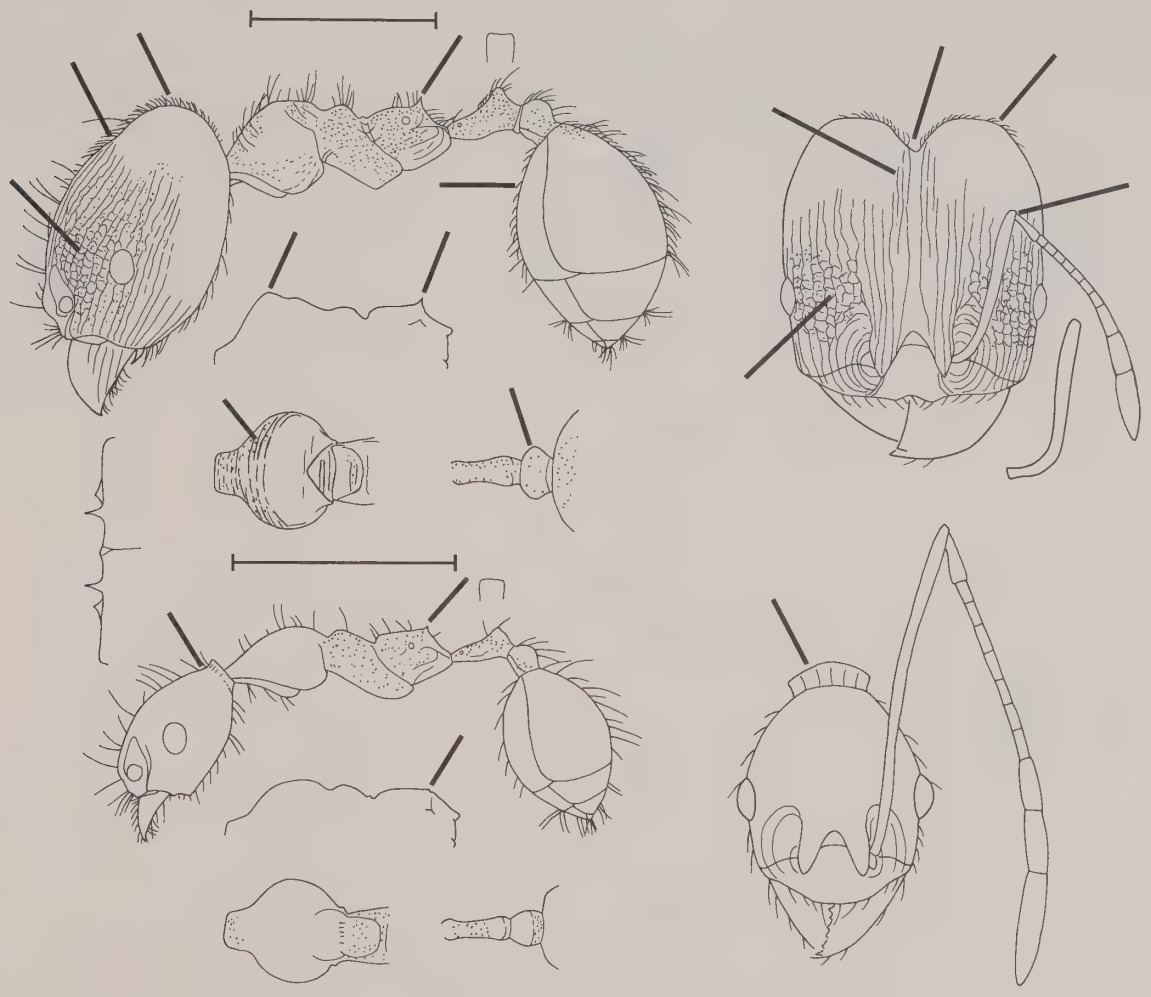
COLOR Major: body and mandibles reddish yellow ("orange") to very light reddish brown.

Minor: reddish yellow ("light orange").

RANGE In addition to the Peruvian type series, I have seen series collected near Diamantino, Mato Grosso, and Benjamin Constant, Amazonas, Brazil (W. L. Brown).

BIOLOGY The type series was reared by Stefan Cover (personal communication) from an incipient colony found in terra firme rainforest at Cuzco Amazónico, Peru, and nesting in a large, crumbling dead log.

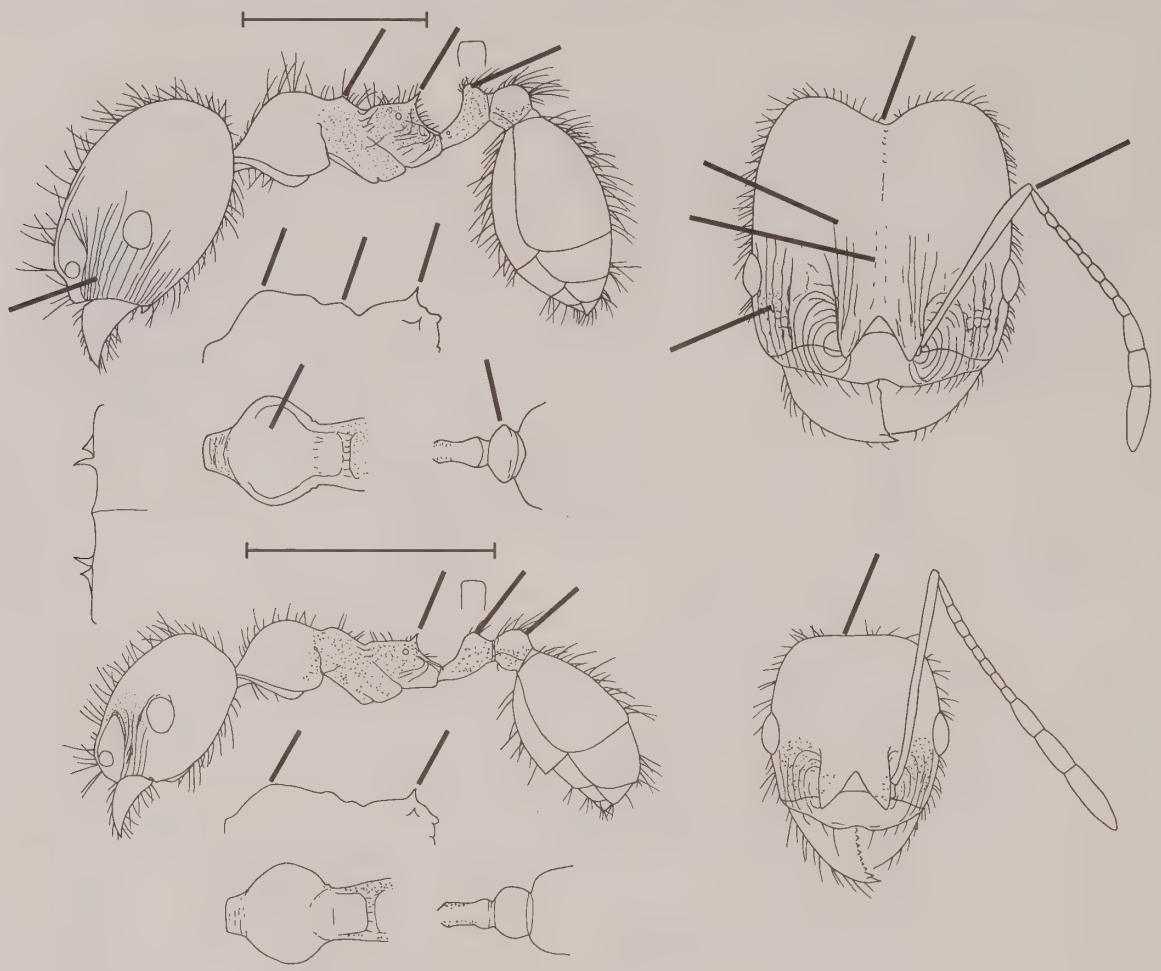
FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios (Stefan Cover and John E. Tobin). Scale bars = 1 mm.



Pheidole cursor **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *cursor,* runner.
DIAGNOSIS A very distinctive member of the *fallax* group recognizable by the following traits.
Major: posterior third of dorsal head profile lined with a dense carpet of very short, suberect hairs of about equal length; the occipital margin in full-face view lined with similar, subrecumbent hairs; a similar layer of short subrecumbent hairs lines the ventral profile of the first gastral sternite; nadir of occipital cleft deep; rugoreticulum on each side of head extends from eye to antennal fossa and frontal carina; humerus in dorsal-oblique view prominent above rest of pronotum; postpetiole seen from above diamond-shaped.
Minor: bicolored (see below); propodeal spine reduced to denticle; occiput constricted to a neck, with very broad nuchal collar.
MEASUREMENTS (mm) Holotype major: HW 1.50, HL 1.56, SL 1.00, EL 0.22, PW 0.68.
Paratype minor: HW 0.54, HL 0.74, SL 1.02, EL 0.16, PW 0.38.
COLOR Major: body and mandibles light reddish brown, legs reddish yellow.
Minor: bicolorous, with head medium brown, mesosoma light brown, and gaster and appendages dark yellow.
RANGE In addition to the types and numerous other series from Cuzco Amazónico, I have seen collections from Benjamin Constant, and Iraboca, near Belém, Amazonian Brazil (W. L. Brown).
BIOLOGY According to Stefan Cover (personal communication), *cursor* was common in both terra firme and seasonally flooded rainforest at Cuzco Amazónico, Peru, nesting in both small and large pieces of rotten wood on the forest floor. Colonies were monogynous and relatively small, containing fewer than 300 workers. The workers were predaceous, and no seed caches or other evidences of seed harvesting were found.

FIGURE Upper: major. Lower: minor. FLORIDA: Wakulla Springs State Park, Wakulla Co. (E. O. Wilson). Scale bars = 1 mm.



Pheidole dentata Mayr

Pheidole morrisi var. *dentata* Mayr 1886d: 457, raised to species level by Forel 1901j: 351. Syn.: *Pheidole commutata* Mayr 1886d: 459, synonymy by Creighton 1950a: 178; *Pheidole dentata* var. *faisonica* Forel 1901j: 352, synonymy by Creighton 1950a: 178; *Leptothorax tennesseensis* Cole 1938a: 238, synonymized under *commutata* by Cole 1948: 82.

TYPES Naturhist. Mus. Wien.

ETYMOLOGY L *dentata,* toothed, presumably referring to the propodeal spines.

DIAGNOSIS A member of the *fallax* group similar in various characters to *bergi, chiapasana, cordiceps, dione, humeridens, industa, laevivertex, madrensis, maja, nitidula,* and *tetroides,* and distinguished as follows.

Major: rugoreticulum of head placed next to antennal fossa in advance of eye level; carinulae of frontal lobes mostly limited to margins of the lobes and extending posteriorly to the level of the eyes only by an Eye Length; occipital margin in full-face view deeply concave; occipital corners smoothly rounded, almost semicircular; humerus and mesonotal convexity low and smooth, rounded in profile; apex of petiolar node in side view strongly tapered; postpetiole from above elliptical, with bluntly angular lateral margins; promesonotal dorsum completely smooth.

Minor: propodeal spines reduced almost to denticles; petiolar and postpetiolar nodes in side view very low; occipital margin in full-face view very feebly concave.

MEASUREMENTS (mm) Major (Wakulla Springs State Park, Florida): HW 1.14, HL 1.26, SL 0.84, EL 0.22, PW 0.60.
Minor (Wakulla Springs State Park): HW 0.58, HL 0.66, SL 0.74, EL 0.14, PW 0.38.

COLOR Coloration and size vary greatly, as described by Naves (1985) in Florida: "I have found colonies of small dark specimens in wooded areas around Gainesville and large specimens that nest in sandy soil on beaches in south Florida and the Florida Keys. I also found a yellowish variant that inhabits the marshlands of the Keys and another variant with quite large majors that vary in color from reddish to very dark brown nesting in open areas around Gainesville." Naves believes that all of the variation is of a single species. On the other hand, Stefan Cover has provided the following suggestive observations that may point toward multiple sibling species: "Variation similar to that reported by Naves in Florida is present throughout much of *dentata*'s range. In many places in the southeastern United States, there are lighter colored open-ground forms and darker forest-inhabiting forms. In at least one case there are associated life-history differences. The typical dark, forest-inhabiting form common in the southeast produces monogynous colonies containing

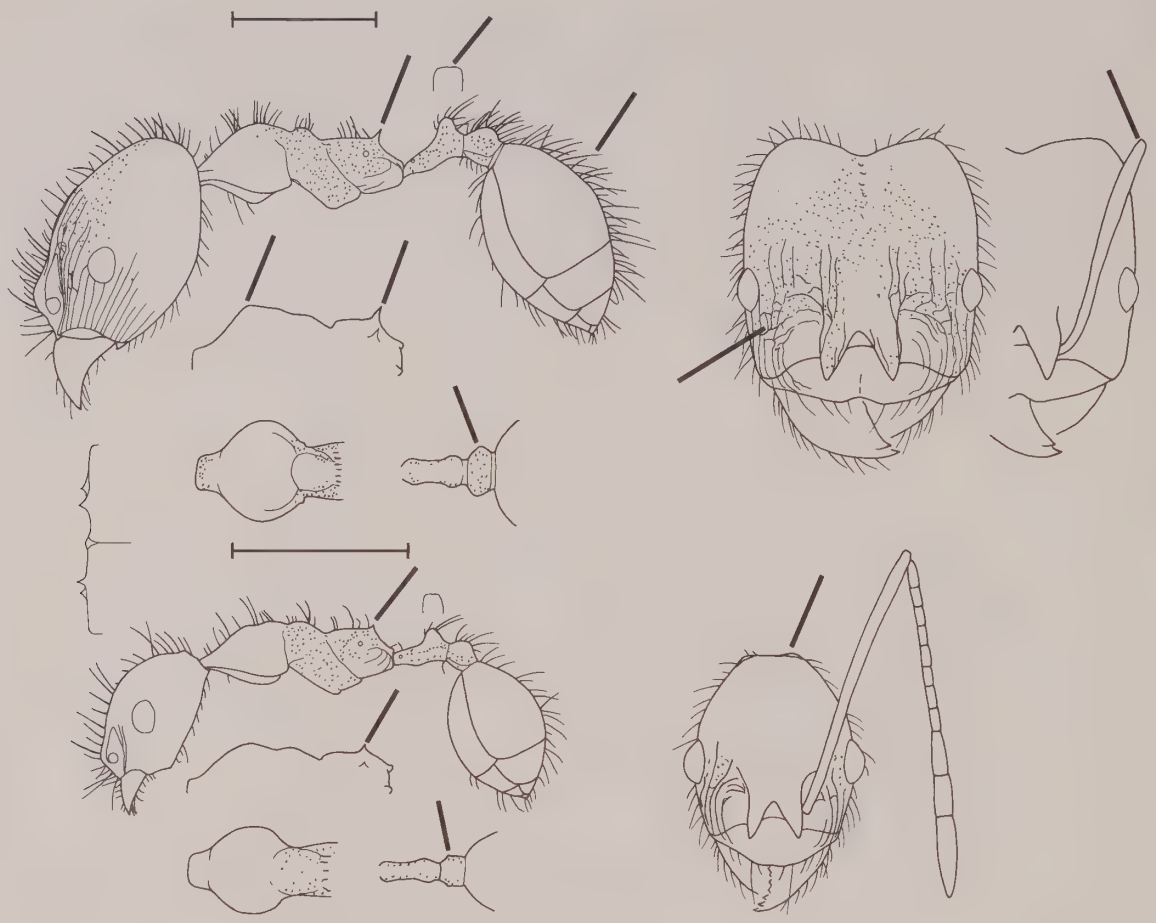
several hundred individuals. In Calvert Co., Maryland, at the northeastern extremity of its range, only a light colored open-ground form is present. It forms polygynous colonies often containing over 5,000 ants. This strongly suggests *dentata* may be a sibling species cluster like the *Aphaenogaster rudis* complex."

RANGE This very adaptable and abundant ant is known to occur from Calvert County, Maryland, south to the Florida Keys, west to Illinois, Kansas, El Paso and the Davis Mountains of Texas, thence south to northern Mexico (Monterrey, Nuevo Leon).

BIOLOGY In the southeastern United States, where I have observed the species (or complex of sibling species) over many years, colonies of *dentata* occur in a wide range of habitats, from relatively thick coniferous and deciduous woodland to beaches and even city streets. They prefer to nest in rotting logs and stumps, but also readily occupy soil beneath pieces of rotting wood and in open ground. In Pensacola, Florida, I found them one of the commonest ants in and around concrete sidewalks. Similar versatility has been reported elsewhere in Florida by Naves (1985) and in western Texas by Moody and Francke (1982). I have found *dentata* to be an easily collected and managed species for laboratory studies, having used colonies to demonstrate enemy specification in alarm-defense communication (Wilson 1975d, 1976a) and the fixed nature of major-minor ratios even in the face of intense predator pressure (Johnston and Wilson 1985). Laboratory colonies feed voraciously and thrive on insects and sugar, growing to maturity within a year or so. G. C. and J. Wheeler (1953b) have provided a description of the larvae of all castes and instars.

Compare principally with *hyatti, portalensis, vistana*; see also *ariel, sitiens, skwarrae*

FIGURE Upper: lectotype, major (antennae missing; companion outline of full-face view of head shows antennal scape of major from Portal, Arizona, to illustrate scape). Lower: paralectotype, minor. TEXAS: Ft. Davis, Jeff Davis Co., 1650 m (W. M. Wheeler). Scale bars = 1 mm.



Pheidole desertorum Wheeler

Pheidole desertorum Wheeler 1906i: 337. Syn.: *Pheidole desertorum* var. *comanche* Wheeler 1906i: 339, synonymy by Creighton 1950a:178; *Pheidole desertorum* var. *maricopa* Wheeler 1906i: 339, synonymy by Creighton 1950a: 178.

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *desertorum,* of the wastelands (deserts).

DIAGNOSIS Similar to the species listed in the heading above, distinguished from these and other members of the *fallax* group as follows.

Major: slender; yellow; antennal scapes very long, slightly exceeding the occipital corner; humerus subangular in dorsal-oblique view; propodeal spines short and slender in side view; a loose rugoreticulum extends from the lateral margins of each frontal lobe to the eye; central half of the dorsum of the head, mesopleuron, propodeum, and waist foveolate and opaque; the rest of the body smooth and shiny.

Minor: slender; yellow; antennal scape very long, exceeding the occipital corner by almost half its length; occiput greatly narrowed, its profile concave in full-face view, but lacking nuchal collar.

MEASUREMENTS (mm) Lectotype major: HW 1.36, HL 1.42, SL (scape missing), EL 0.28, PW 0.64 (Portal, Arizona, major, HW 1.36, SL 1.32).

Paralectotype minor: HW 0.58, HL 0.82, SL 1.10, EL 0.22, PW 0.40.

COLOR Major: reddish yellow except for gaster, which is yellowish brown.

Minor: concolorous reddish yellow.

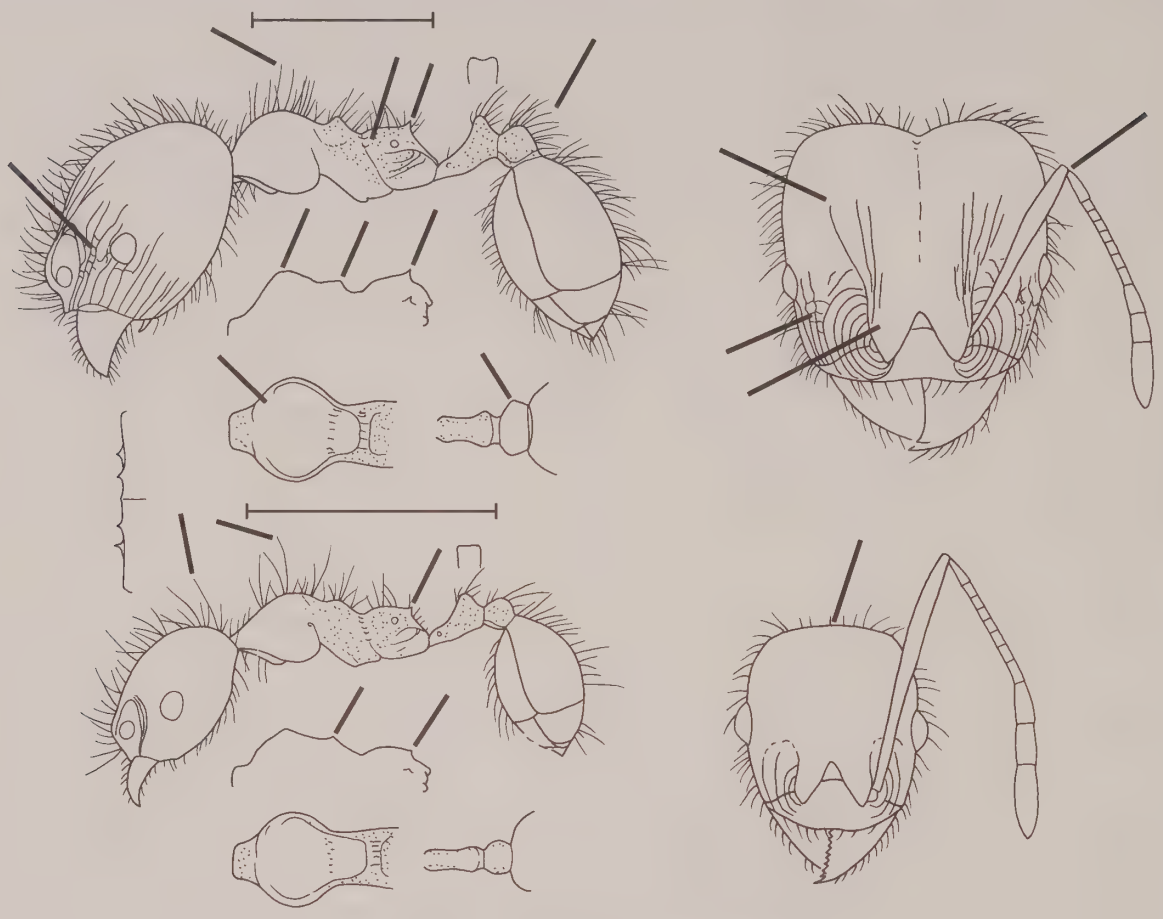
RANGE Abundant from western Oklahoma and Texas west to southern Utah, Nevada, and California, and south into northern Mexico.

BIOLOGY *P. desertorum* occurs to at least 1700 m in a wide range of desert habitats, including mesquite or acacia-dominated bajadas, rocky slopes, and desert grasslands. The colonies construct large crater nests with single entrance holes. Helms (1995) reports that colonies in southeastern Arizona are large, at maturity comprising 2,500–25,000 workers and one to multiple queens, and often occur in multiple nests. Foragers, mostly minors but with a few majors also present, are active outside the nest at night and following rains. On diet, Stefan Cover (personal communication) has stated from extensive personal experience, "Contrary to previous reports in

the literature (Davidson 1977a, b; Whitford 1978), *P. desertorum* is an aggressive predator and scavenger, not a granivore. Seeds are only rarely collected, and then in small quantities." Most colonies produce reproductives each year, which are extremely sex-biased from colony to colony. Winged reproductives have been found in nests from early June to late August. According to Helms, mating flights occur prior to sunrise in the late summer, following rainfall. Males form aerial swarms into which the winged queens fly; mating then occurs on the ground, after which the queens fly away in search of nest sites. Colonies are usually founded by single queens, but occasionally by small groups. Droual (1983) has described the remarkably efficient maneuvers of nest defense and evacuation by *desertorum* colonies under attack by army ants *(Neivamyrmex nigrescens)*. Droual and Topoff (1981) have demonstrated that emigrations to new nest sites also occur at a high frequency even under apparently stable environmental conditions.

Compare with *bergi, cordiceps, dentata, eidmanni, nitidula*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ARGENTINA: Jujuy. Scale bars = 1 mm.

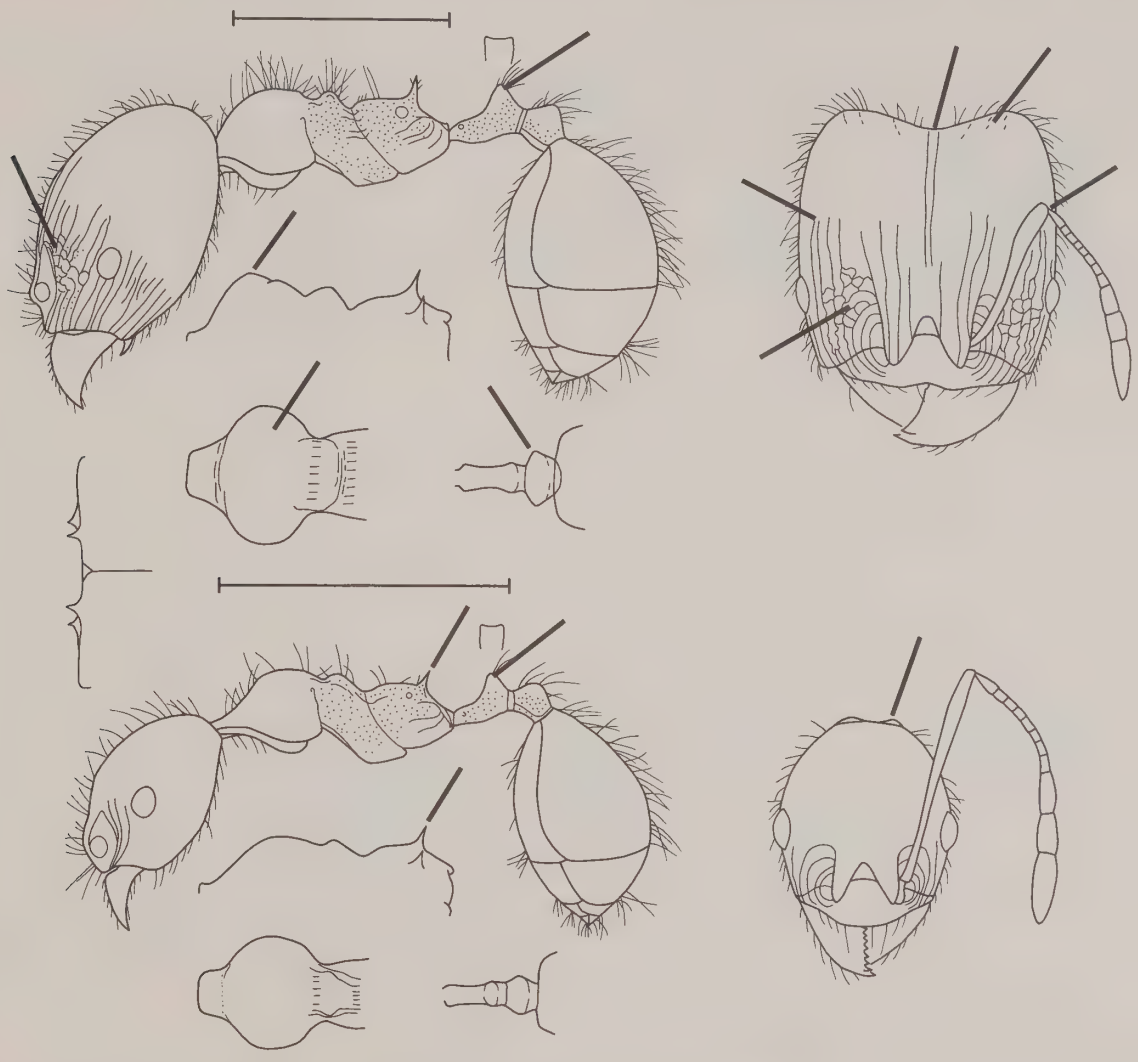


Pheidole dione Forel, **new status**

Pheidole rufipilis var. *dione* Forel 1913m: 225.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY Gr *dione,* a matronymic name for Aphrodite.
DIAGNOSIS A member of the *fallax* group, most similar to the species listed in the heading above, distinguished as follows.
Major: antennal scapes reaching within 2× their maximum width to occipital corners; rugoreticulum on each side of head forming a band from eye laterally to antennal fossa and forward slightly anterior to eye; carinulae on frontal lobes limited to their lateral margins and extending posteriorly to midway between eye and occipital margin; propodeal spines small, equilaterally triangular; pronotal profile in dorsal-oblique view a single convexity, and mesonotal profile subangular; postpetiole from above laterally subangulate; pronotum smooth; pilosity dense and long, many hairs longer than Eye Length.
Minor: pilosity long, some hairs 2× Eye Length; propodeal spines reduced to denticles; mesonotal convexity in dorsal-oblique view subangulate; occiput in frontal view feebly convex.
MEASUREMENTS (mm) Lectotype major: HW 1.26, HL 1.34, SL 0.94, EL 0.18, PW 0.62.
Paralectotype minor: HW 0.60, HL 0.66, SL 0.84, EL 0.14, PW 0.40.
COLOR Major: body and appendages plain light brown.
Minor: body plain light brown, appendages yellowish brown.
RANGE Known only from the types.
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (Stefan Cover). Scale bars = 1 mm.



Pheidole dossena **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *dossena,* clown, jester, referring to the odd head coloration.

DIAGNOSIS A member of the *fallax* group, similar to *bergi* in some traits, but easily distinguished from it and other group members as follows.

Major: brownish yellow with a conspicuous circular brown spot in center of vertex, and yellow appendages. Propodeal spines thin, one-third as long as the basal propodeal face and vertical to it; petiolar node very high, tapering in side view at the apex to form a blunt point; postpetiole from above elliptical, with subangulate lateral margins; rugoreticulum extending on each side of head from eye to antennal fossa; carinulae along midline reach from vertex to occiput, and flanked on occiput by short, feeble carinulae, with rest of posterior half of dorsal head surface smooth.

Minor: propodeal spines long and thin; occiput narrowed, with nuchal collar; carinulae cross border between mesopleuron and side of propodeum.

MEASUREMENTS (mm) Holotype major: HW 1.14, HL 1.22, SL 0.64, EL 0.14, PW 0.56.
Paratype minor: HW 0.52, HL 0.64, SL 0.68, EL 0.12, PW 0.34.

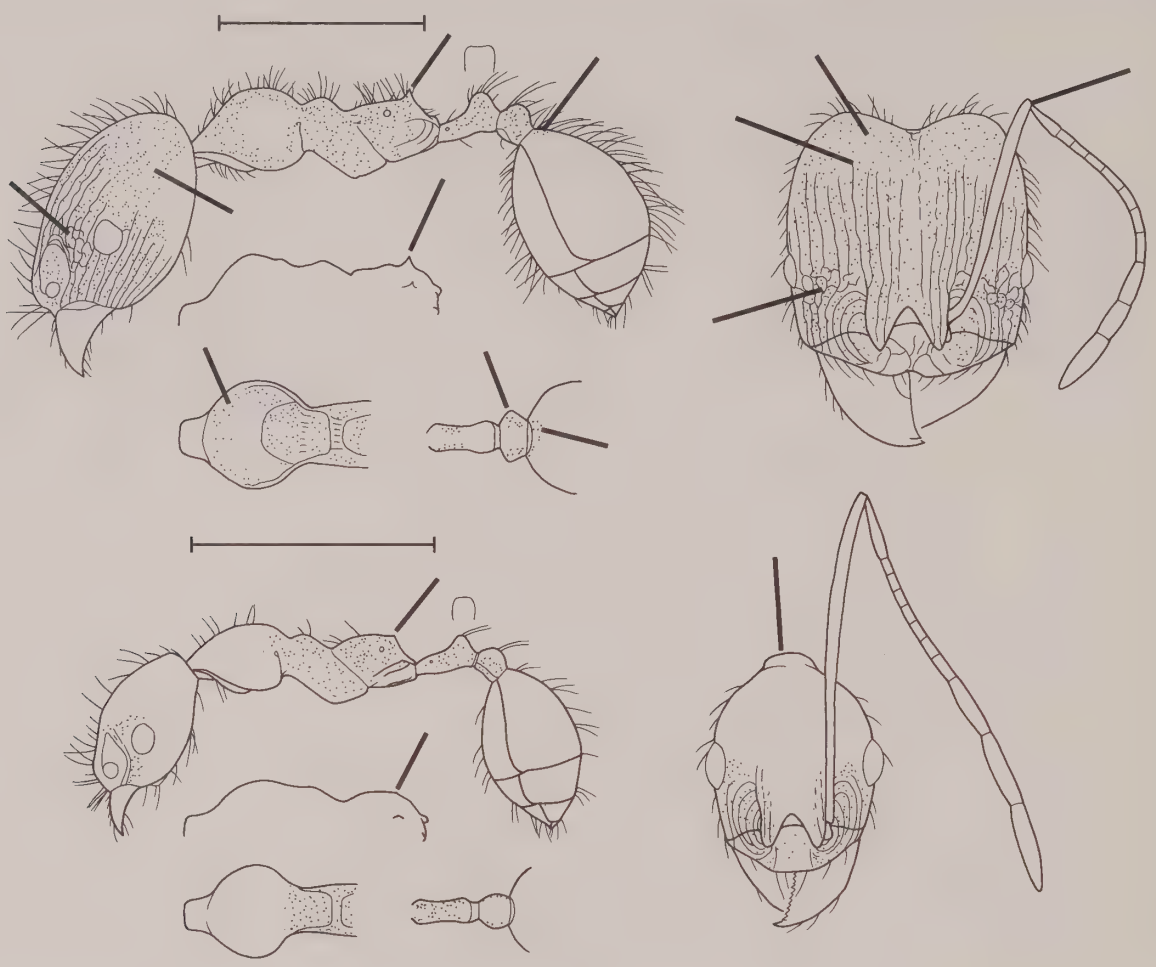
COLOR Major: body and mandibles light brownish yellow, verging to light brown in a circular spot in center of vertex; appendages clear yellow.
Minor: body brownish yellow, tending to clear yellow on mesosoma and waist, with a brownish tinge on head and gaster; appendages clear yellow.

RANGE I have seen material from numerous localities in lowland southern Mexico (Palenque, Chiapas), Belize, Guatemala, Honduras, Costa Rica, and Panama.

BIOLOGY Occurs on the floor of lowland forest, nesting in rotting wood.

Compare with species listed
in the Diagnosis below

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ARGENTINA: Tanti Viejo, Córdoba. Scale bars = 1 mm.

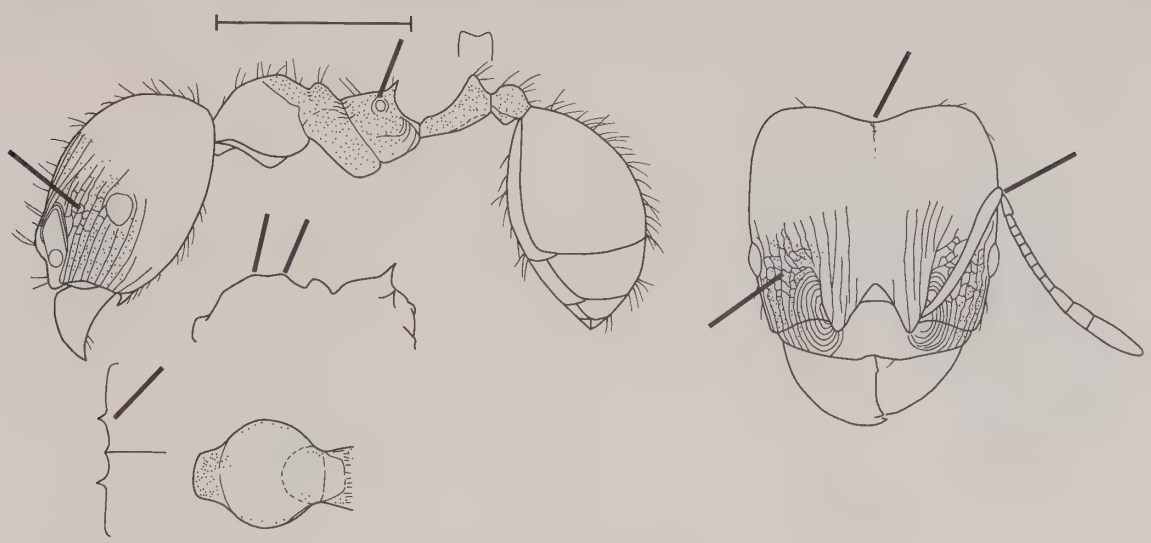


Pheidole durionei Santschi, **new status**

Pheidole wolfringi st. *durionei* Santschi 1923d: 51.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY Eponymous.
DIAGNOSIS A member of the "*jujuyensis* complex" of the larger *fallax* group, comprising *araneoides, cuevasi, durionei, jujuyensis, kugleri, leonina, leptina, lucretii, lupus, paraensis, punctithorax, tijucana, wallacei,* and *wolfringi*. *P. durionei* is distinguished as follows.
Major: antennal scape exceeding occipital corner by 2× its own maximum width; carinulae on dorsal surface of head reaching almost all the way to the occiput, which is foveolate and opaque; rugoreticulum on head stretches on each side from eye to antennal fossa and anteriorly almost to the anterior border of the head; margins of pronotal dorsum foveolate; propodeal spines equilaterally triangular; postpetiole from above diamond-shaped, with angular lateral margins.
Minor: propodeal spines reduced to barely discernible denticles; region mesad to and forward from eyes foveolate; occiput narrowed, with nuchal collar.
MEASUREMENTS (mm) Lectotype major: HW 1.20, HL 1.34, SL 1.22, EL 0.24, PW 0.60.
Paralectotype minor: HW 0.52, HL 0.74, SL 1.08, EL 0.16, PW 0.40.
COLOR Major: body and appendages light reddish brown except for gaster, which is plain medium brown.
Minor: concolorous brownish yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Lectotype, major. BRAZIL: Mogidas-Cruzes, São Paulo. Scale bar = 1 mm.

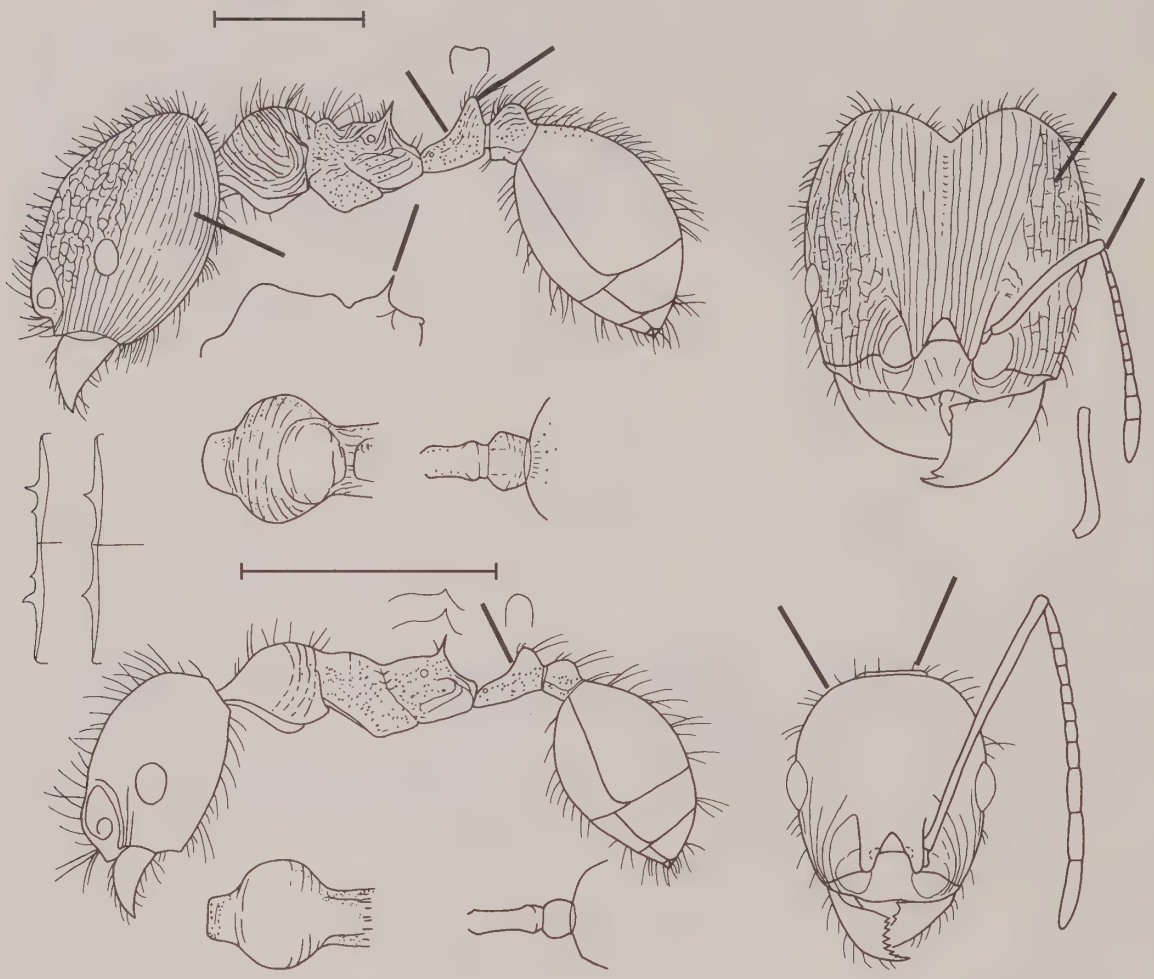


Pheidole eidmanni Menozzi

Pheidole eidmanni Menozzi 1926c: 69.

TYPES Instituto di Entomologia "Guido Grandi."
ETYMOLOGY Named after the entomologist H. Eidmann.
DIAGNOSIS A member of the *fallax* group, similar in different characters to *bergi, cordiceps, nitidula,* and *pampana,* and especially so with *nitidula,* with which it may be synonymous, and distinguished as follows.
Major: concavity of occipital border very broad in frontal view; rugoreticulum less extensive on genae (than in *nitidula*); in dorsal-oblique view, humerus lower than convexity that follows it; pronotum completely smooth and shiny.
MEASUREMENTS (mm) Lectotype major: HW 1.06, HL 1.08, SL 0.64, EL 0.20, PW 0.56.
COLOR Major: body concolorous medium reddish brown.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: major (compared with lectotype); variation in hypostomal teeth shown is with specimens from Puerto Rico (4 teeth) and Cuba (3 teeth). Lower: minor (compared with paralectotype, which shares the long, thin propodeal spine depicted; the very short spine at the top is of a Panama specimen, and the medium-length spine in the middle is of a syntype of the synonymous "var. *columbica*"). CUBA: Soledad, Las Villas. (Type locality: Cuba.) Scale bars = 1 mm.

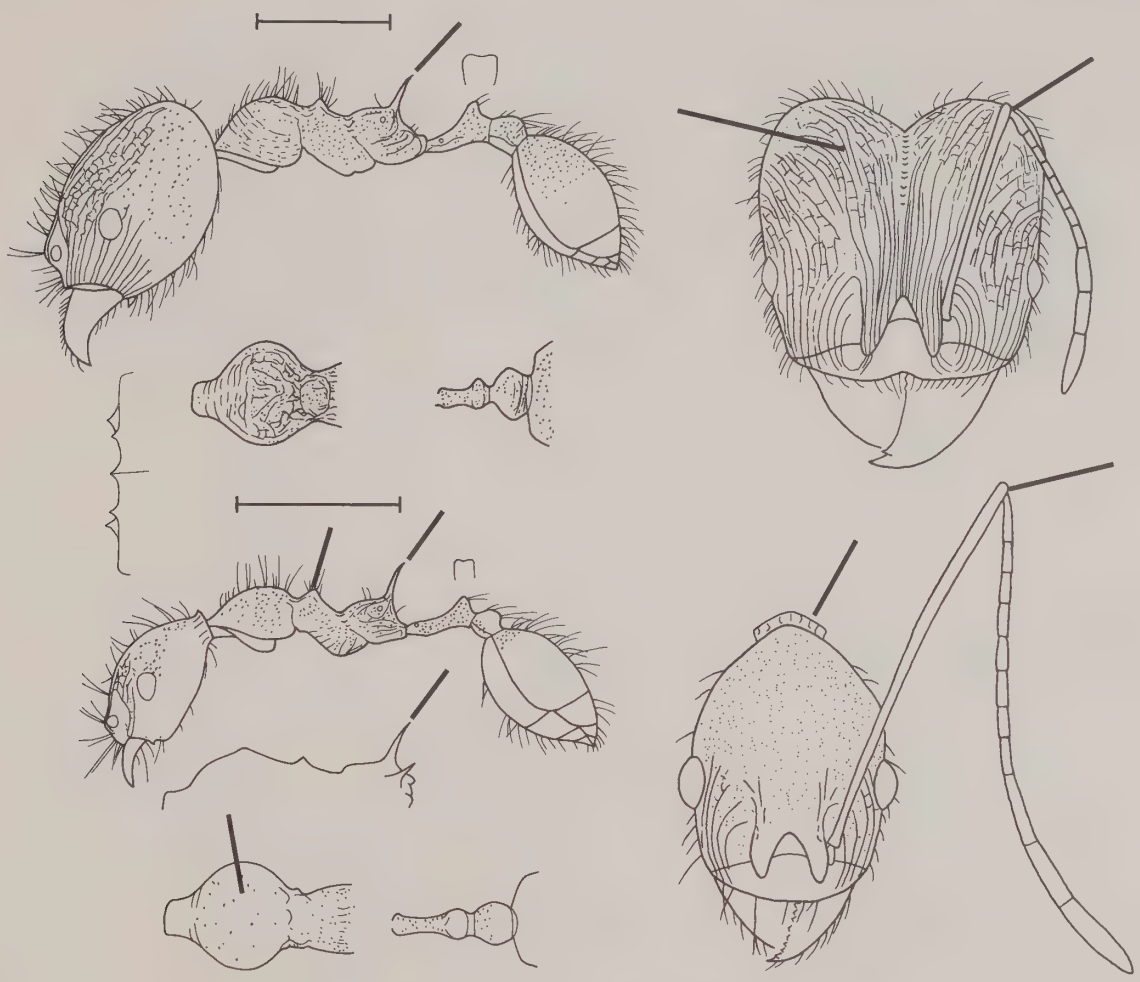


Pheidole fallax Mayr

Pheidole fallax Mayr 1870b: 984. Syn.: *Pheidole fallax* r. *columbica* Forel 1886b: xliv, n. syn.; *Pheidole jelskii* var. *fallacior* Forel 1901j: 356, n. syn.; *Pheidole fallax* var. *britoi* Forel 1912g: 221, n. syn.; *Pheidole fallax* var. *ovalis* Forel 1912g: 221, n. syn. Raised to species level in this monograph: infraspecific variants *jelskii, obscurithorax, puttemansi*.

TYPES Naturhist. Mus. Wien.
ETYMOLOGY L *fallax,* deceitful, false; allusion unknown.
DIAGNOSIS A member of the *fallax* group, similar to *gigas, jelskii, obscurithorax, puttemansi, roushae, tobini,* and *valens,* and especially the very abundant and widespread *jelskii,* with which it is easily confused.
Major: posterior half of dorsal surface of head primarily carinulate, with rugoreticulum extensive mesad of the eye most of the way to the occiput; pronotum transversely carinulate; anterior fourth to third of central strip of first gastral tergite shagreened; head tapered toward occiput in side view, as shown.
P. fallax differs from *P. jelskii* as follows and as depicted: in **major**, petiolar node higher and descending to peduncle by a much more concave curve, and scapes shorter (Scape Length/Head Width 0.50–0.59 as opposed to 0.60–0.70 in *jelskii* major); and in **minor**, occiput much broader and nuchal collar thinner than in *jelskii*.
MEASUREMENTS (mm) Lectotype major: HW 1.72, HL 1.84, SL 0.90, EL 0.24, PW 0.80.
Paralectotype minor: HW 0.60, HL 0.72, SL 0.92, EL 0.18, PW 0.40.
COLOR Major and minor: body medium reddish brown, with gaster sometimes dark reddish brown.
RANGE A circum-Caribbean species, which I have verified from the Greater Antilles (Cuba, Jamaica, Puerto Rico), Central America, Colombia, and Venezuela. No certain records exist from the Lesser Antilles, where the closely related *jelskii* abounds.
BIOLOGY Because *fallax* has a range enclosed by the more abundant *jelskii* and is so easily confused with it, natural history notes published in the past under the name of either species are generally unreliable.

FIGURE Upper: major. Lower: minor. COSTA RICA: Lago Hula, Heredia (E. O. Wilson). (The minor was compared with a syntype in the Museum of Comparative Zoology, Harvard University; type locality is Jimenez, Costa Rica; collected by Anastasio Alfaro.) Scale bars = 1 mm.



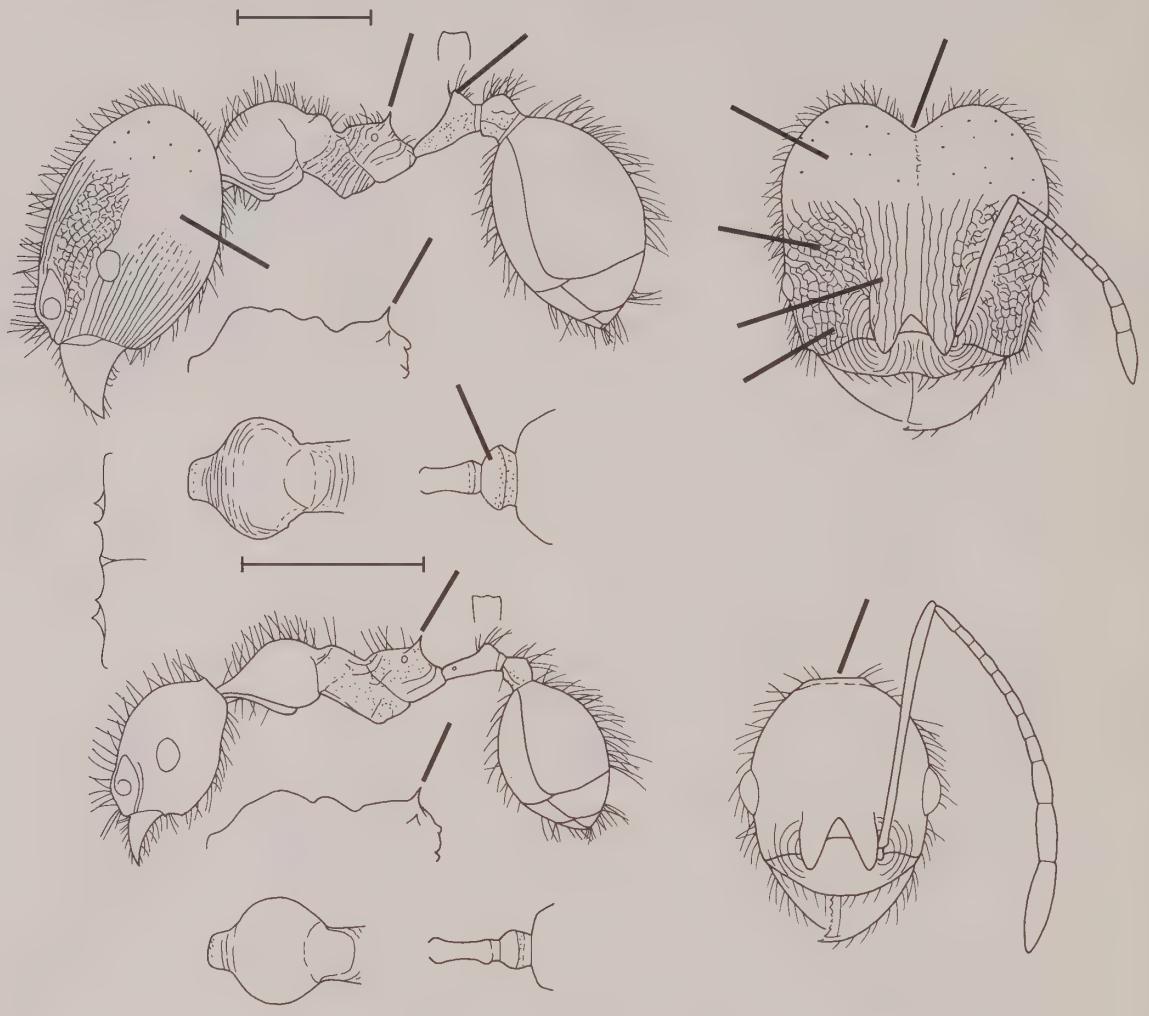
Pheidole fiorii Emery

Pheidole fiorii Emery 1890c: 51.

TYPES Mus. Civ. Stor. Nat. Genova; Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after Andrea Fiori.
DIAGNOSIS A medium-sized member of the *fallax* group with extremely long propodeal spines and scapes in both castes.
Major: occiput, lateral sections of the head, and posterior strip of pronotum rugoreticulate.
Minor: dorsal surface of head and almost all of mesosoma foveolate to some degree and opaque to subopaque, although the degree of foveolation is variable and parts of the head and promesonotum are often nearly smooth and shiny.
Similar to *ajax, hector, jaculifera,* and *lourothi,* differing in many details of body form, sculpturing, and pilosity. On variation, John T. Longino (1997) writes: "This species (or species complex) shows a common pattern of being darker at higher elevations . . . It also exhibits spatial variation in the pilosity of the major worker head. Collections from sea level to about 600 m on the Atlantic slope are yellow, and the major worker has the sides of head with abundant erect setae. Collections from higher elevations in Braulio Carrillo National Park are dark brown, and the major worker continues to have the sides of head with abundant erect setae. Collections from the Peñas Blancas Valley are dark brown, and the major worker has the sides of head with sparse, appressed setae."
MEASUREMENTS (mm) Major (Lago Hula, Costa Rica): HW 1.48, HL 1.52, SL 1.24, EL 0.24, PW 0.68.
Minor: HW 0.64, HL 0.92, SL 1.40, EL 0.18, PW 0.48.
COLOR Yellow to dark brown, with increasing elevation (see under Diagnosis above).
RANGE Atlantic slope and montane Costa Rica to 950 m.
BIOLOGY Longino (1997) observes, as I have, that *fiorii* "inhabits mature wet forest understory. It makes hemispherical carton nests under individual leaves of palms, aroids, and other large-leaved plants. The nests are on the order of 10 cm across, and usually at head height or lower. Colonies appear to be monogynous and with a single nest." Longino notes also that *fiorii* has varied greatly in abundance at La Selva and Peñas Blancas from one season or year to the next, for unknown reasons. At Peñas Blancas he observed a nest being raided by a colony of the army-ant-like ponerine genus *Simopelta*.

Compare with *huacana* and *oliveirai*

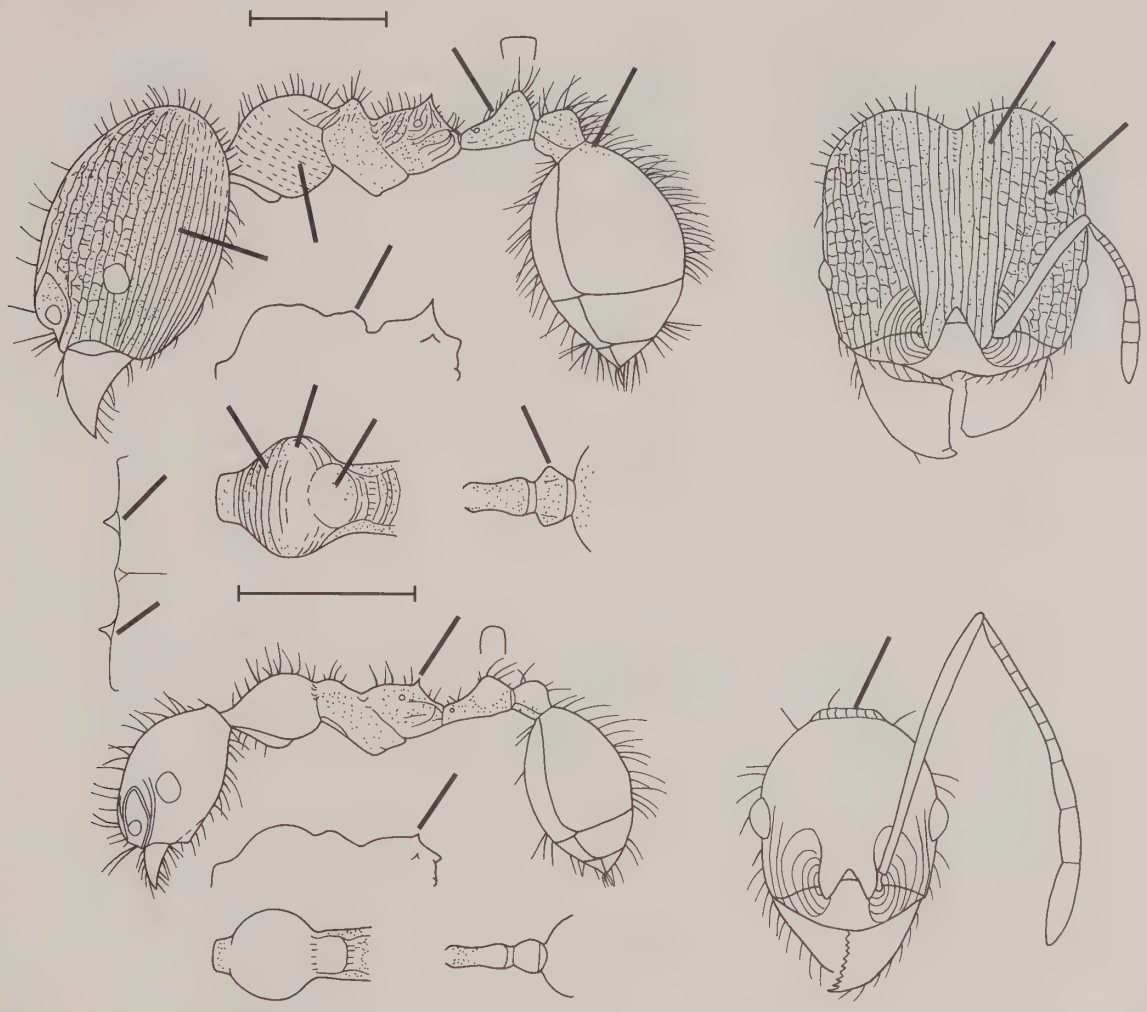
FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios (Stefan Cover and John E. Tobin). Scale bars = 1 mm.



Pheidole galba **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *galba,* yellow.
DIAGNOSIS A member of the *fallax* group, close to *huacana* and *oliveirai* and distinguished as follows.
Major: yellow; rugoreticulum on each side of the head reaches from the anterior border of the head capsule to a third of the way from eye level to occiput level; at the posterior end the rugoreticula give way to short carinulae that travel obliquely backward toward the sides of the head; rear half of posterior venter of head smooth; posterior third of dorsal surface of head mostly smooth but sprinkled with foveae; vertex rugulose and carinulate; propodeal spines well developed; postpetiolar dorsum smooth.
Minor: propodeal spines well developed; occiput narrowed, with nuchal collar.
MEASUREMENTS (mm) Holotype major: HW 1.82, HL 1.92, SL 1.02, EL 0.26, PW 0.84.
Paratype minor: HW 0.72, HL 0.84, SL 1.04, EL 0.18, PW 0.50.
COLOR Major: light reddish yellow.
Minor: clear medium yellow.
RANGE Known only from the type locality and the Cocha Cashu Biological Station, Manu National Park; also in Madre de Dios, Peru.
BIOLOGY Two colonies collected at Cuzco Amazónico were nesting in clay soil of terra firme forest. One of the nests was surmounted by a castle-like superstructure of soil particles.

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: Mun. Anápolis, km 46 on road to Goiania, Goiás (William L. and Doris E. Brown). Scale bars = 1 mm.

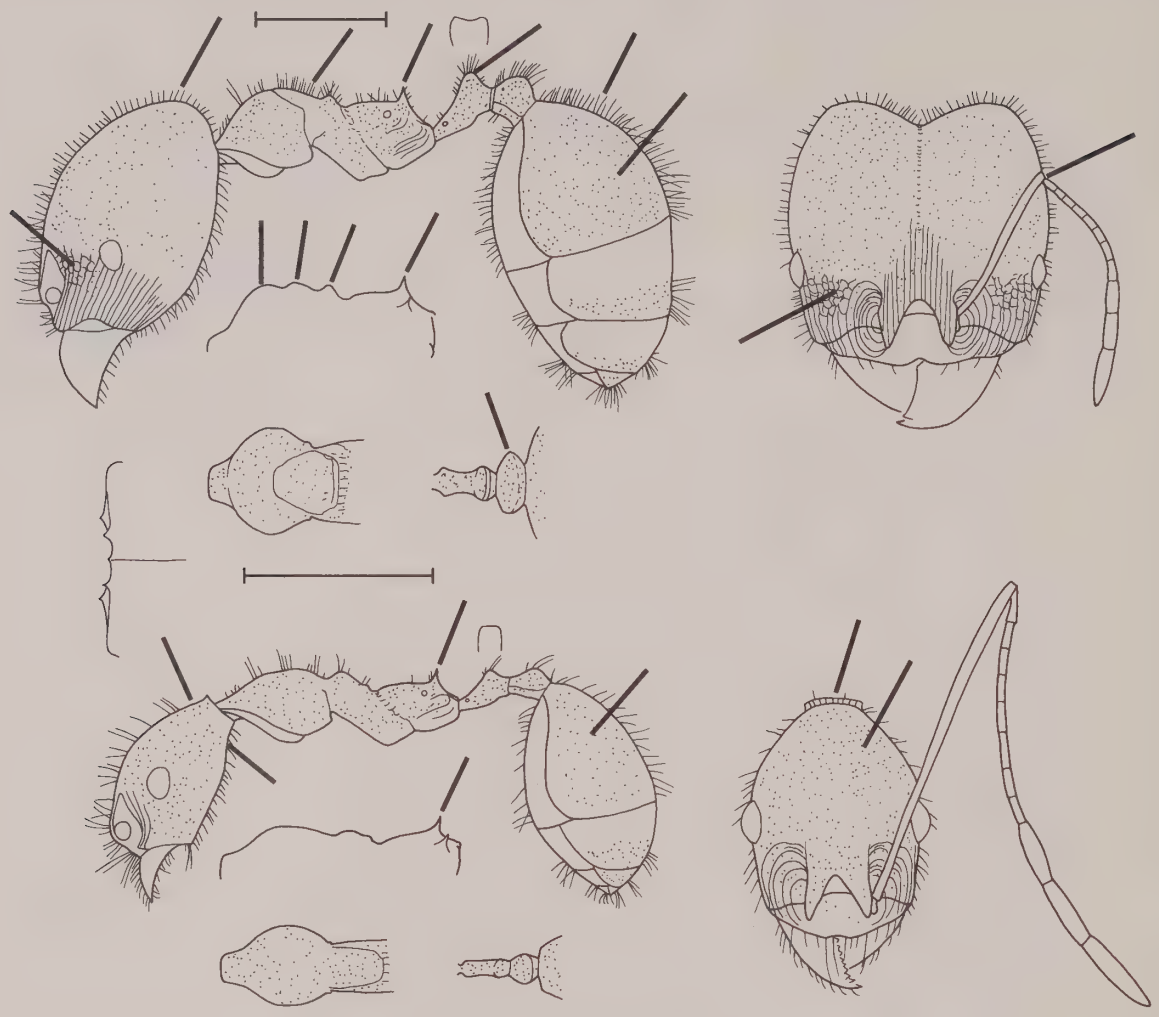


Pheidole gigas **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *gigas,* giant.
DIAGNOSIS A large member of the *fallax* group most similar to *obscurithorax* of Argentina (and exotic in the southern U. S.), and somewhat less so to the *fallax, jelskii,* and *puttemansi,* differing as follows.
Major: robust; hypostoma 2-toothed; entire head heavily sculptured, with genae, venter, and broad median strip (including frontal lobes) longitudinally carinulate and most of the remainder, from genae to occiput, rugoreticulate; most of pronotal and propodeal dorsa transversely carinulate; anterior strip of first gastral tergite shagreened; promesonotal convexity in dorsal-oblique view strongly lobose and directed posteriorly; petiolar peduncle very thick, petiolar node low; postpetiole laterally angulate, scape broadened at insertion.
Minor: occiput narrow, with nuchal collar; head and pronotum shiny; propodeal spines reduced to denticles.
MEASUREMENTS (mm) Holotype major: HW 2.00, HL 1.96, SL 1.06, EL 0.24, PW 0.94.
Paratype minor: HW 0.60, HL 0.80, SL 1.00, EL 0.16, PW 0.46.
COLOR Major: gaster and postpetiole dark reddish brown, rest of body medium reddish brown.
Minor: gaster dark reddish brown, rest of body light to medium reddish brown.
RANGE Known only from the type locality and from Manaus, Amazonas, Brazil (J. C. Trager).
BIOLOGY The type colony was collected in *cerrado,* or tropical savanna. A seed cache was found in the nest.

Compare with *aequiseta, tolteca*

FIGURE Upper: major. Lower: minor. COSTA RICA: Rio Tempisque, Palo Verde, Guanacaste (Charles Kugler). (Compared with syntypes.) Scale bars = 1 mm.

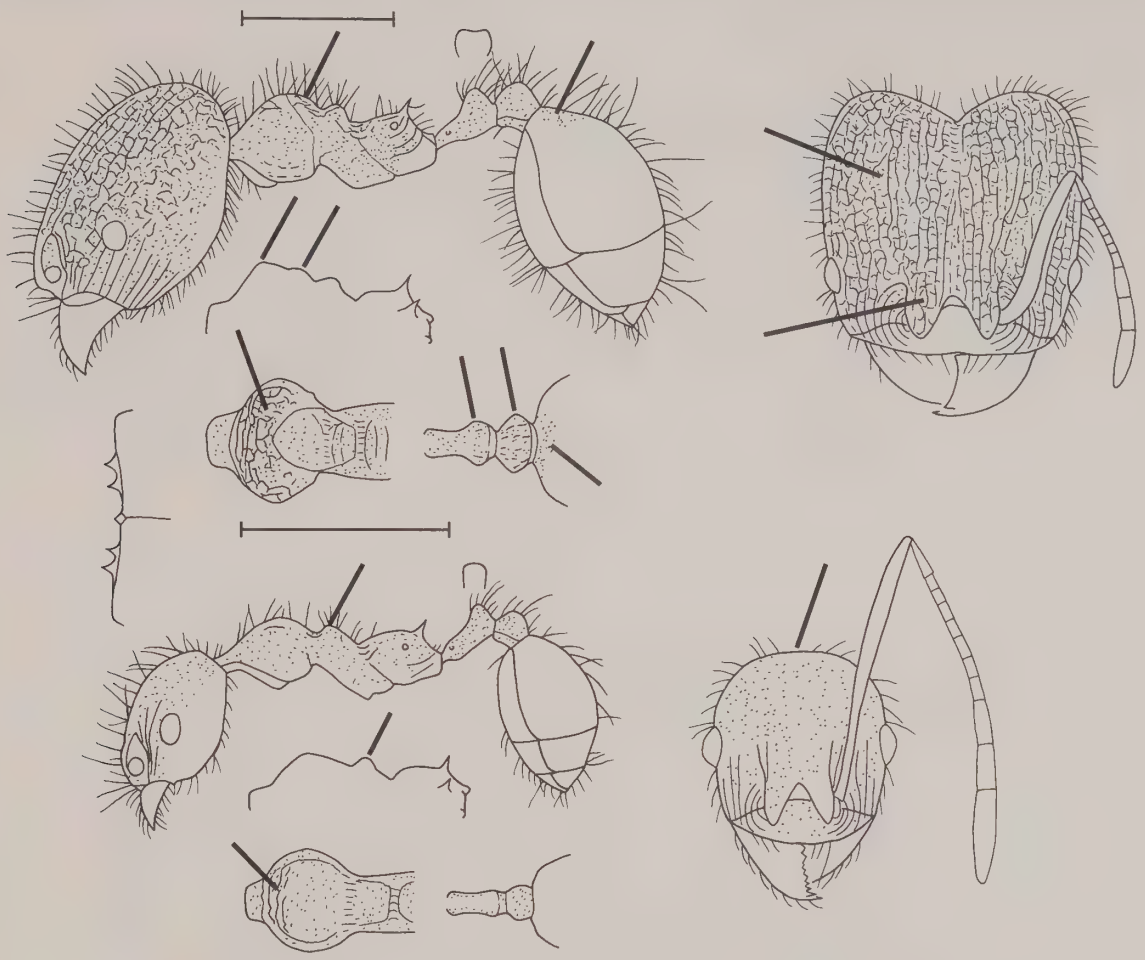


Pheidole gouldi Forel

Pheidole gouldi Forel 1886b: xlii.

TYPES Mus. Hist. Nat. Genève; Mus. Comp. Zool. Harvard.
ETYMOLOGY Eponymous, no attribution given.
DIAGNOSIS A member of the *fallax* group instantly recognizable by the following traits.
Major: reddish yellow; entire body covered by short, bristle-like, exclusively erect hairs that on each body part are approximately of equal length; all of head, mesosoma, and waist foveolate and opaque; all of first gastral tergite and posterior strips of succeeding tergites very finely shagreened and opaque, and first gastral tergite often with bluish reflections; antennal scape reaches halfway from level of eye to level of occiput; postpetiolar node from above elliptical.
Minor: occiput drawn out into a long neck, with nuchal collar; all of head, mesosoma, and waist foveolate and opaque; all of first gastral tergite and posterior strips of succeeding tergites shagreened and opaque.
MEASUREMENTS (mm) Major (Palo Verde, Costa Rica): HW 1.66, HL 1.72, SL 1.32, EL 0.24, PW 0.78.
Minor (Palo Verde, Costa Rica): HW 0.78, HL 1.04, SL 1.42, EL 0.22, PW 0.52.
COLOR Major: body and appendages light reddish yellow ("orange") except for the gaster, which is medium reddish yellow; first gastral tergite has in addition bluish reflections.
Minor: body medium yellowish brown, appendages light yellowish brown.
RANGE Recorded from Campeche and Yucatán, Mexico; Guatemala; Honduras; and the northwestern lowlands of Costa Rica.
BIOLOGY In Costa Rica, according to Longino (1997), *gouldi* is an inhabitant of seasonally dry habitats. He has encountered it in the xeric scrub of Santa Rosa National Park and along roadsides. In Campeche, Mexico, I found a colony in a double-cratered nest in dense bushes of a moist thorn woodland.

FIGURE Upper: holotype, major. Lower: paratype, minor. NICARAGUA: Rio Kukra (Ivette Perfecto). Scale bars = 1 mm.

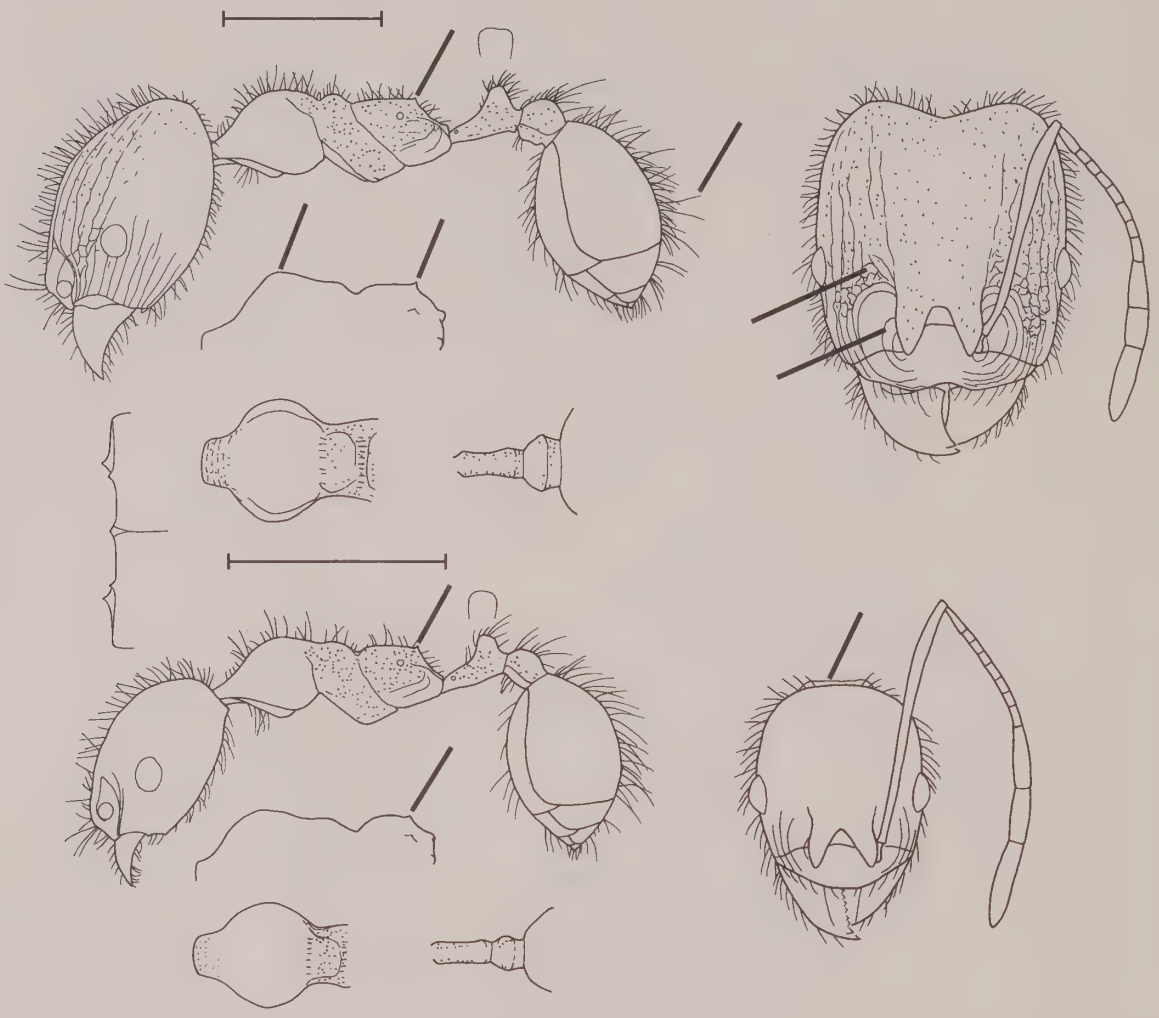


Pheidole gulo **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *gulo,* glutton, wolverine.
DIAGNOSIS A member of the *fallax* group somewhat similar to *cockerelli* and *perpilosa* (see also the less similar species listed with them), but easily distinguished as follows.
Major: yellow; almost entire dorsal and lateral surfaces of head rugoreticulate, including frontal lobes, as illustrated; almost all of mesosoma and waist foveolate and opaque; pronotal dorsum in addition rugoreticulate; dorsa of petiolar and postpetiolar nodes in addition faintly carinulate; anterior fringe of central strip of first gastral tergite shagreened; pronotal profile in dorsal-oblique view bilobous; postpetiole from above diamond-shaped.
Minor: yellow; dorsal surface of head, mesosoma, and waist foveolate and opaque; anterior strip of pronotal dorsum rugulose; occiput narrowed but at most with a very thin nuchal collar; mesonotal convexity very prominent.
MEASUREMENTS (mm) Holotype major: HW 1.46, HL 1.52, SL 1.00, EL 0.22, PW 0.76.
Paratype minor: HW 0.62, HL 0.74, SL 1.00, EL 0.16, PW 0.44.
COLOR Major: body medium reddish yellow ("orange"), appendages light reddish yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *azteca*

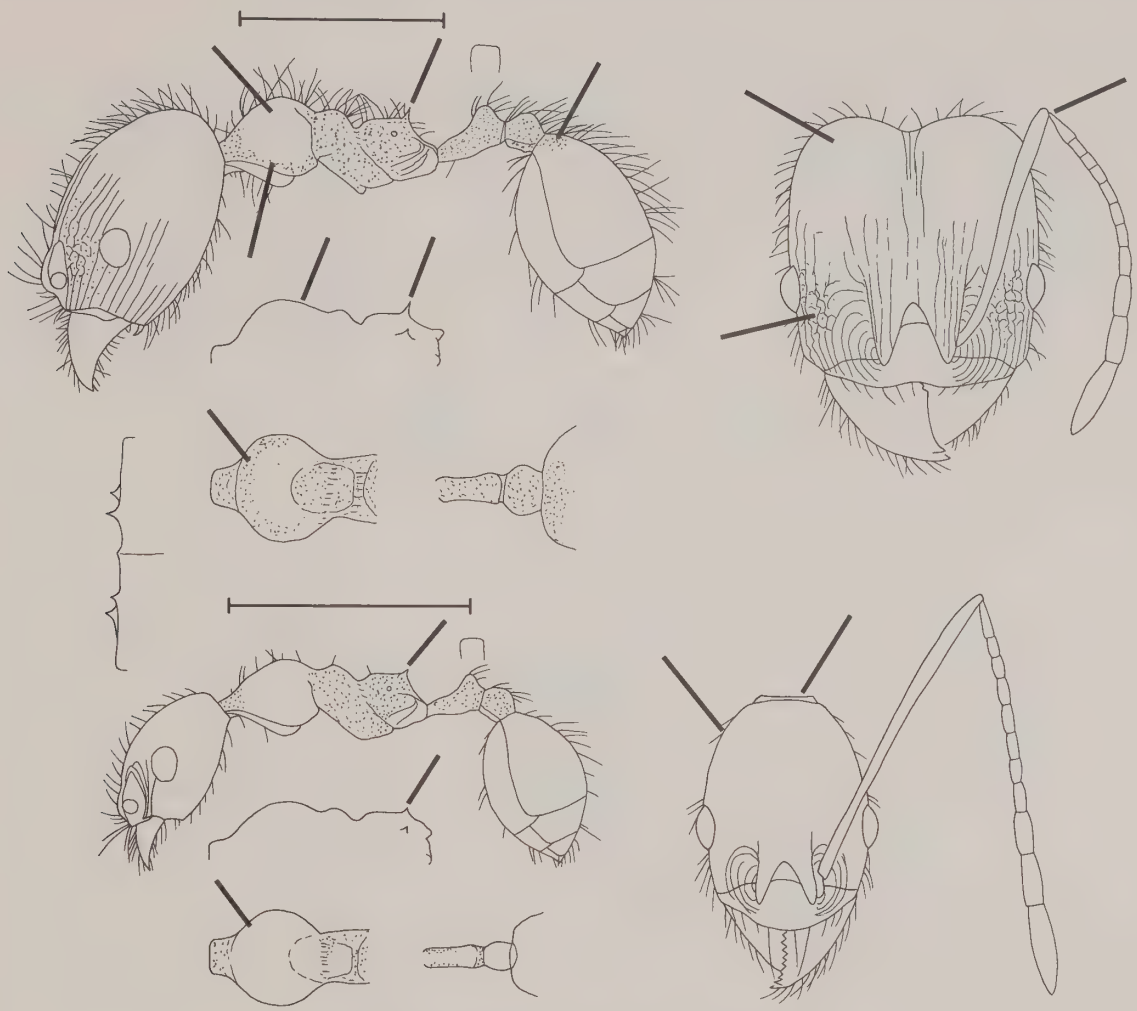
FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: 10 km northwest of Ixtlán, Nayarit (Robert J. Hamton). Scale bars = 1 mm.



Pheidole hamtoni **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the collector, Robert J. Hamton.
DIAGNOSIS A member of the *fallax* group, close to *azteca* but differing from it and other species of the group by the following combination of traits. Both major and minor brownish yellow.
Major: head capsule 1.14× longer than broad; hypostomum with 5 teeth; propodeal spine greatly reduced, to a rudimentary denticle; postpetiolar node from above short and bell-shaped; pilosity erect and very dense; rugoreticulum present between each eye and the nearby antennal fossa; carinulae mesad to the eye extend almost all the way to the occipital border.
Minor: propodeal spines reduced to denticles; occiput narrowed slightly, with a nuchal collar.
MEASUREMENTS (mm) Holotype major: HW 1.32, HL 1.50, SL 1.22, EL 0.22, PW 0.74.
Paratype minor: HW 0.64, HL 0.78, SL 1.02, EL 0.16, PW 0.44.
COLOR Major: body concolorous brownish yellow, except for gaster, which is a shade darker.
Minor: concolorous brownish yellow.
RANGE Known from the type locality and from 8 km northwest of Tequila, Jalisco, 1220 m (R. J. Hamton).
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. BOLIVIA: Saavedra Experimental Farm (James C. Trager). Scale bars = 1 mm.

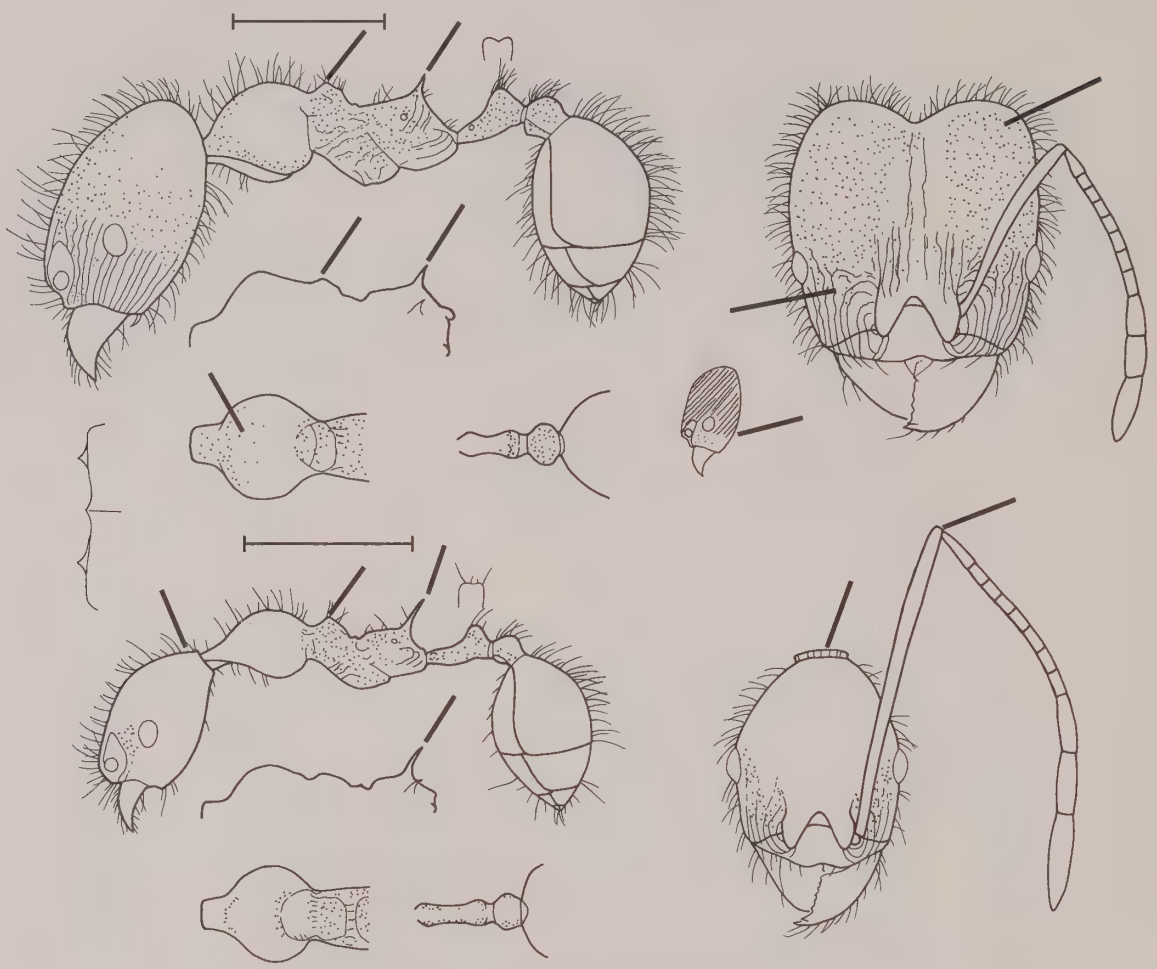


Pheidole haskinsorum **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named for the distinguished myrmecologists Caryl P. and Edna F. Haskins.
DIAGNOSIS A small member of the *fallax* group, similar to *lattkei, obscurior, petrensis,* and *susannae,* and distinguished by the following traits.
Major: small; antennal scape surpasses occipital corner by its own maximum width; posterior third of head capsule devoid of sculpturing except for several carinulae along the midline that run to the occiput; rugoreticulum limited to a small patch just mesad to the eyes; head subrectangular in shape; pronotum bare except for foveolae on anterior and lateral margins; a thin anterior fringe of shagreening present on first gastral tergite.
Minor: head in full-face view with an unusual, symmetrically elliptical shape; nuchal crest present; propodeal spines short and thin.
MEASUREMENTS (mm) Holotype major: HW 0.84, HL 0.94, SL 0.86, EL 0.16, PW 0.52.
Paratype minor: HW 0.48, HL 0.16, SL 0.86, EL 0.16, PW 0.34.
COLOR Major: body dark reddish brown, appendages medium reddish brown.
Minor: head, mesosoma, and waist dark brown; gaster and appendages light brown.
RANGE Known from the type locality and from the Yasuni National Park of Ecuador.
BIOLOGY The type series was collected in a burned-over pasture as the workers retrieved insects.

Compare with *ajax, fiorii, jaculifera, lourothi*

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Wilson Botanical Garden, 4 km south of San Vito, Puntarenas, 1200 m (J. T. Longino). Scale bars = 1 mm.



Pheidole hector **new species**

TYPES INBio.

ETYMOLOGY Gr *Hector,* legendary Trojan hero.

DIAGNOSIS A large, bicolorous brown-and-yellow member of the *fallax* group with exceptionally long propodeal spines, especially in the **minor**, dense pilosity, and angulate mesonotal convexity.

Similar to *ajax, fiorii, jaculifera,* and *lourothi,* differing in many details of body form, sculpturing, and pilosity, as illustrated, as well as in color.

MEASUREMENTS (mm) Holotype major: HW 1.54, HL 1.64, SL 1.36, EL 0.22, PW 0.78.

Paratype minor: HW 0.78, HL 1.00, SL 1.46, EL 0.20, PW 0.56.

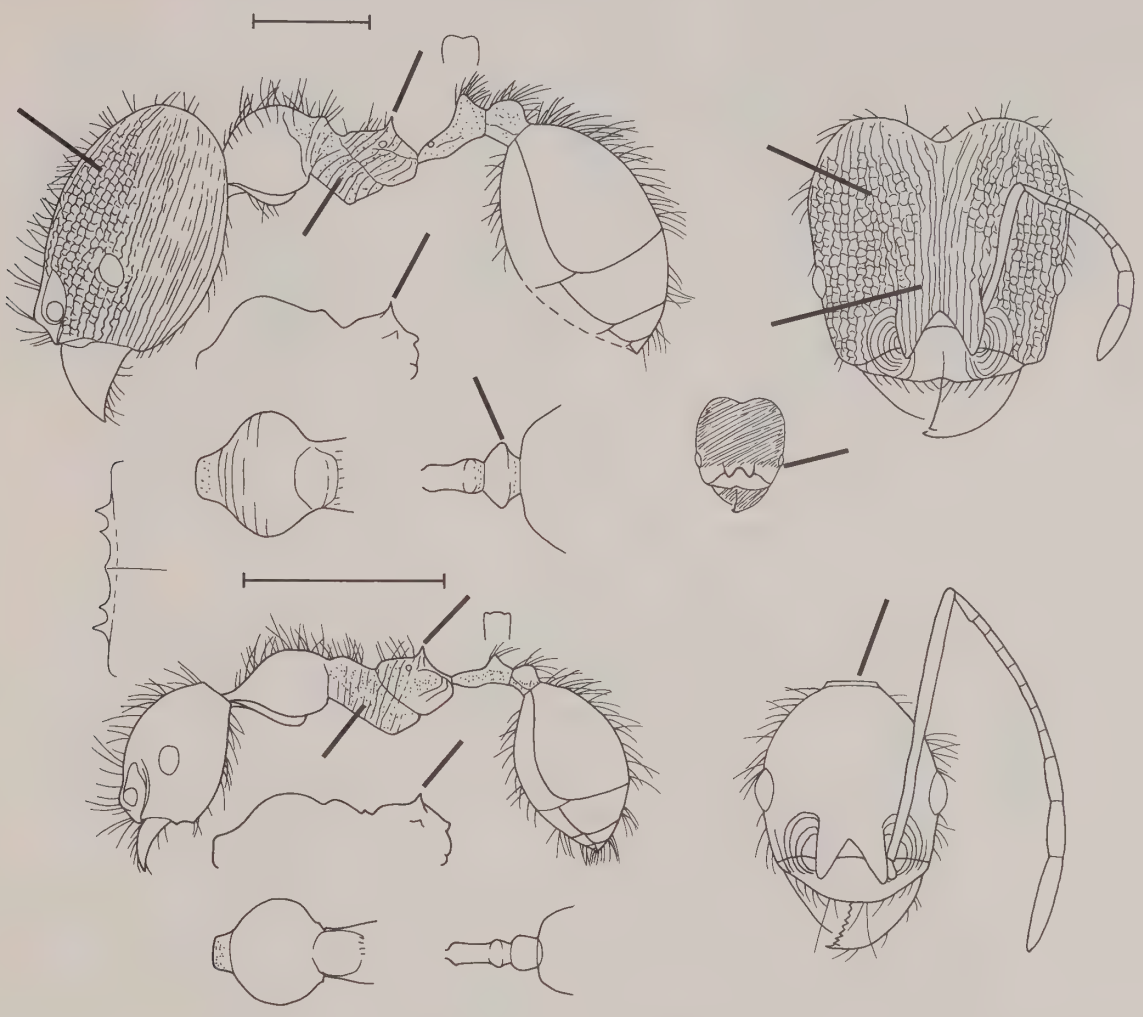
COLOR Major: body medium brown; genae anterior to eyes, as well as mandibles and tarsi, a contrasting yellow.

Minor: body medium brown, legs light brown, tarsi yellow.

RANGE Known only from the type locality.

BIOLOGY Under dead wood in moist forest (Longino 1997).

FIGURE Upper: holotype, major (Jiménez, near Guápiles, Limón). Lower: minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (E. O. Wilson). Scale bars = 1 mm.



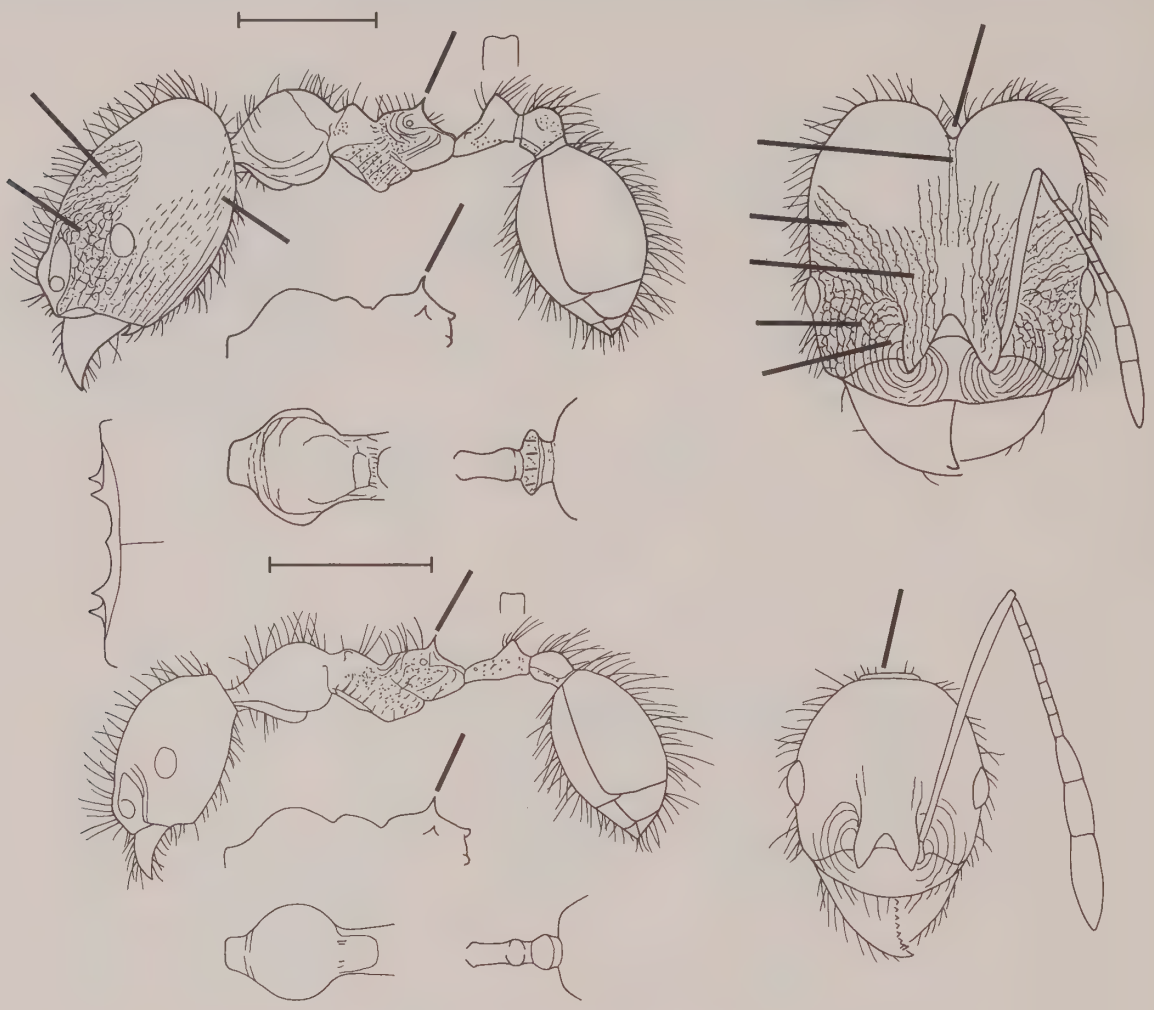
Pheidole hirsuta Emery

Pheidole hirsuta Emery 1896g: 65.

TYPES Mus. Civ. Stor. Nat. Genova.
ETYMOLOGY L *hirsuta,* hairy.
DIAGNOSIS A large dark brown (**major**) or medium reddish brown (**minor**) member of the *fallax* group.
Major: a bicolorous head; rugoreticulation extending on either side of the dorsum of the head from its anterior margin to near the occiput, separated by a band of carinulae that originates on the frontal lobes; mesopleuron and side of propodeum covered by longitudinal carinulae; and propodeal spine short and erect.
Minor: bicolorous; completely smooth and shiny except for circular carinulae around the antennal fossae and longitudinal carinulae that cover the mesopleuron and side of propodeum; nuchal collar present.
Similar to *lourothi,* differing in many details of the characters described above.
MEASUREMENTS (mm) Holotype major: HW 1.96, HL 2.00, SL 1.14, EL 0.26, PW 0.94.
Minor: HW 0.64, HL 0.82, SL 1.06, EL 0.14, PW 0.46.
COLOR Major: head bicolorous, mostly medium brown, with anterior one-fourth of capsule, including clypeus, genae anterior to eyes and anterior tips of frontal lobes yellowish brown; rest of body mostly dark brown; appendages light brown.
Minor: blackish brown, with contrasting yellow clypeal lateral wings, mandibles, antennal club, and tarsi.
RANGE Atlantic and Pacific lowlands of Costa Rica (J. T. Longino 1997).
BIOLOGY Nests in soil in mature wet forest (separate collections by J. T. Longino and E. O. Wilson).

Compare with *galba, oliveirai*

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Quincemil, Cuzco, 750 m (L. Pena). Scale bars = 1 mm.



Pheidole huacana **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *huacana,* from *huaca,* belonging to Inca spirits of the land.

DIAGNOSIS A member of the *fallax* group, close to *galba* and *oliveirai,* distinguished as follows.

Major: yellow; nadir of occipital mid-cleft seen in full-face view very deep, reached by carinulae that start on the vertex and run along the mid line of the head; rugoreticulum on each side of head runs from the eye to and into the circular carinulae around the antennal fossa; the rugoreticulum leads at the level of the posterior margin of the eye to weak rugulae that proceed obliquely toward the lateral head margin; frontal lobes mostly covered by rugulae; propodeal spines well-developed, often nearly vertical as shown; postpetiolar node from above transversely carinulate.

Minor: propodeal spines well-developed; occiput narrowed, with nuchal crest. Propodeal spines directed strongly upwards.

MEASUREMENTS (mm) Holotype major: HW 1.88, HL 2.08, SL 1.10, EL 0.24, PW 0.92.

Paratype minor: HW 0.76, HL 0.94, SL 1.18, EL 0.18, PW 0.54.

COLOR Major: concolorous reddish yellow ("orange").

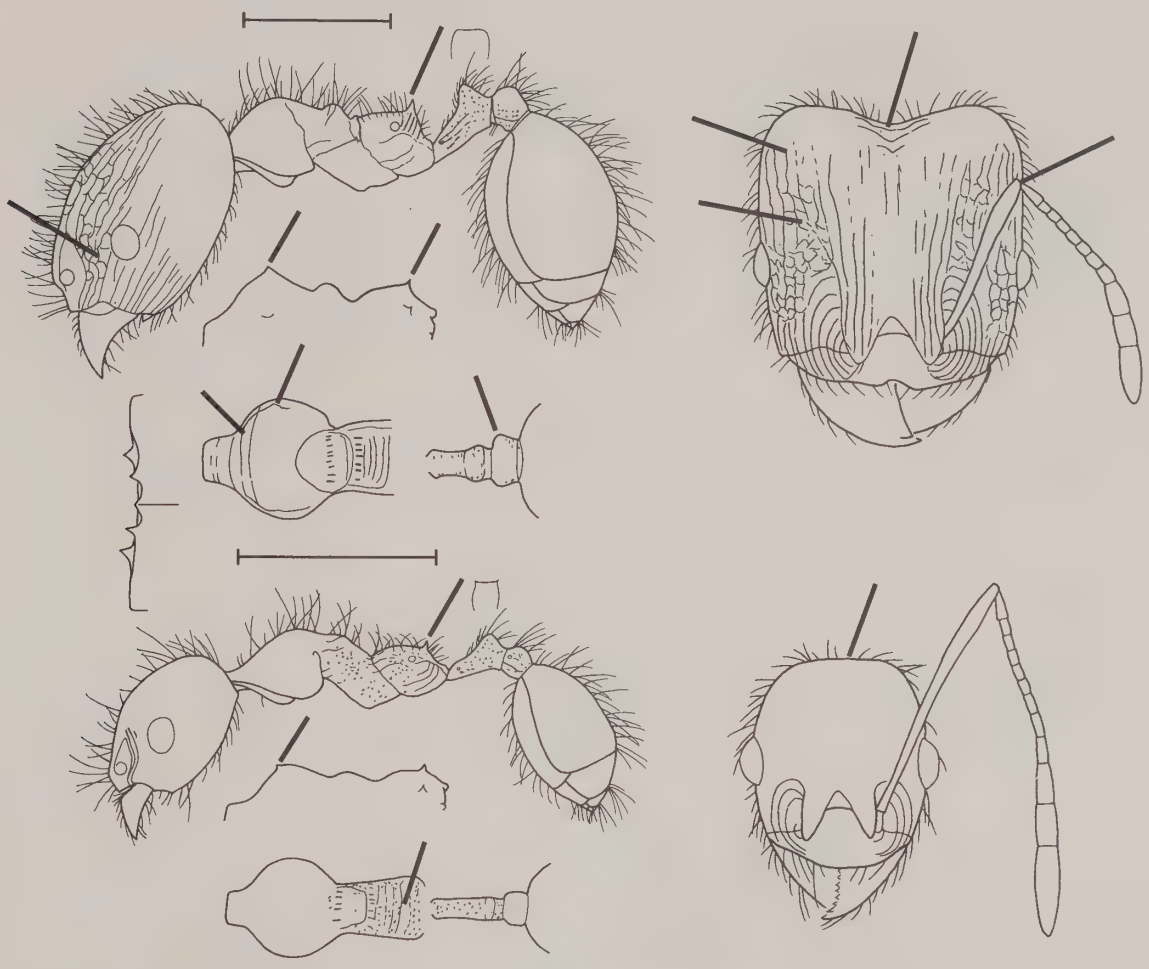
Minor: concolorous medium yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

Compare with *chiapasana, dentata, laeviventris, madrensis, maja, tetroides*

FIGURE Upper: holotype, major. Lower: paratype, minor. ARGENTINA: Buenos Aires (James C. Trager). Scale bars = 1 mm.



Pheidole humeridens **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *humeridens,* shoulder-tooth.

DIAGNOSIS A member of the *fallax* group similar in various characters to the species listed above, differing as follows.

Major: humerus dentate; rugoreticulum on sides of head extends to halfway between eyes and level of occiput; mid-occiput transversely carinulate; antennal scapes reach halfway between eyes and level of occiput; anterior edge of pronotum and all of propodeal dorsum transversely carinulate; in side view, propodeal spines short, vertical to basal propodeal face; from above, postpetiole oval.

Minor: bicolored (see below); humerus toothed; propodeal tooth small and thin; propodeal dorsum carinulate; occiput in full-face view flat.

MEASUREMENTS (mm) Holotype major: HW 1.50, HL 1.56, SL 1.02, EL 0.26, PW 0.78.

Paratype minor: HW 0.74, HL 0.80, SL 0.94, EL 0.20, PW 0.46.

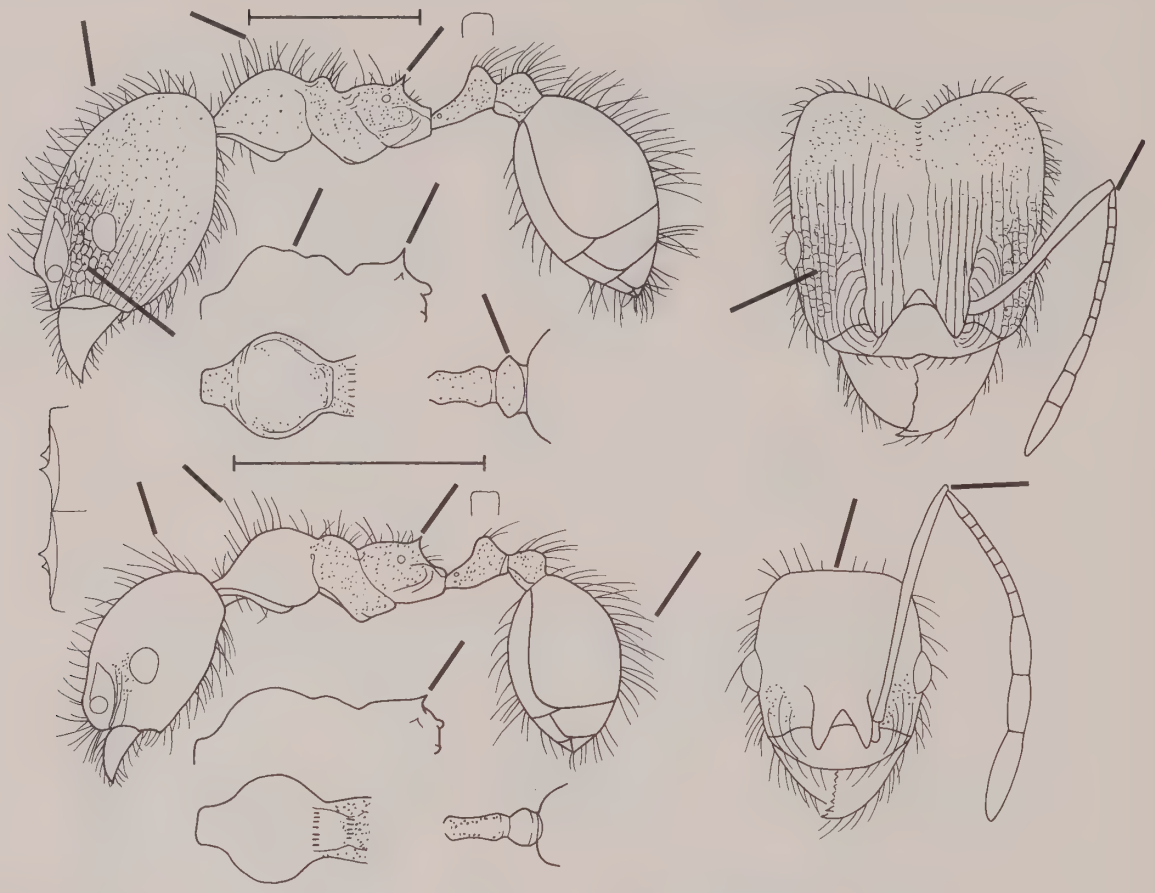
COLOR Major: brownish yellow, with rear halves of gastral tergites changing to light brown.

Minor: bicolored, with head, gaster, and pronotal dorsum medium brown, and rest of body and appendages brownish yellow.

RANGE Known only from the type locality.

BIOLOGY At the type locality *humeridens* colonies occupied conspicuous mound nests in a heavily grazed pasture.

FIGURE Upper: syntype, major. CALIFORNIA: San Jacinto. Lower: minor. ARIZONA: Huachuca Mts. (compared with minor syntype). Scale bars = 1 mm.



Pheidole hyatti Emery

Pheidole hyatti Emery 1895d: 295. Syn.: *Pheidole vaslitii* Pergande 1896: 883, synonymy by Ward 2000: 85; *Pheidole hyatti* var. *ecitonodora* Wheeler 1908h: 463, synonymy by Creighton 1950a: 180; *Pheidole hyatti* subsp. *solitanea* Wheeler 1915b: 409, n. syn.

TYPES Mus. Civ. Stor. Nat. Genova; Nat. Mus. Nat. Hist. U. S.

ETYMOLOGY Eponymous.

DIAGNOSIS Similar to *ariel, desertorum,* and *vistana,* differing from these and other members of the *fallax* group as follows. Reddish yellow (**major**) or light reddish brown (**minor**); antennal scape moderately long, flattened basally, approaching the occipital border to within about half its own maximum width; pilosity over all the body dorsum dense, very long, and erect to suberect; in dorsal-oblique view, pronotum faintly bilobous and humerus rounded; an extensive rugoreticulum stretches from in front of and mesad to each eye to the circular carinulae of the antennal fossa; dorsum of head and sides of mesosoma and waist foveolate and opaque.

Minor: occiput broad, lacking nuchal collar; pilosity of body dorsum dense, very long, and erect to suberect; propodeal spines small but well-formed; mesopleuron and sides of propodeum and waist foveolate and opaque; rest of body smooth and shiny.

According to Stefan Cover (personal communication), *hyatti* is likely a complex of sibling species.

MEASUREMENTS (mm) Syntype major: HW 1.32, HL 1.34, SL 0.98, EL 0.22, PW 0.64.

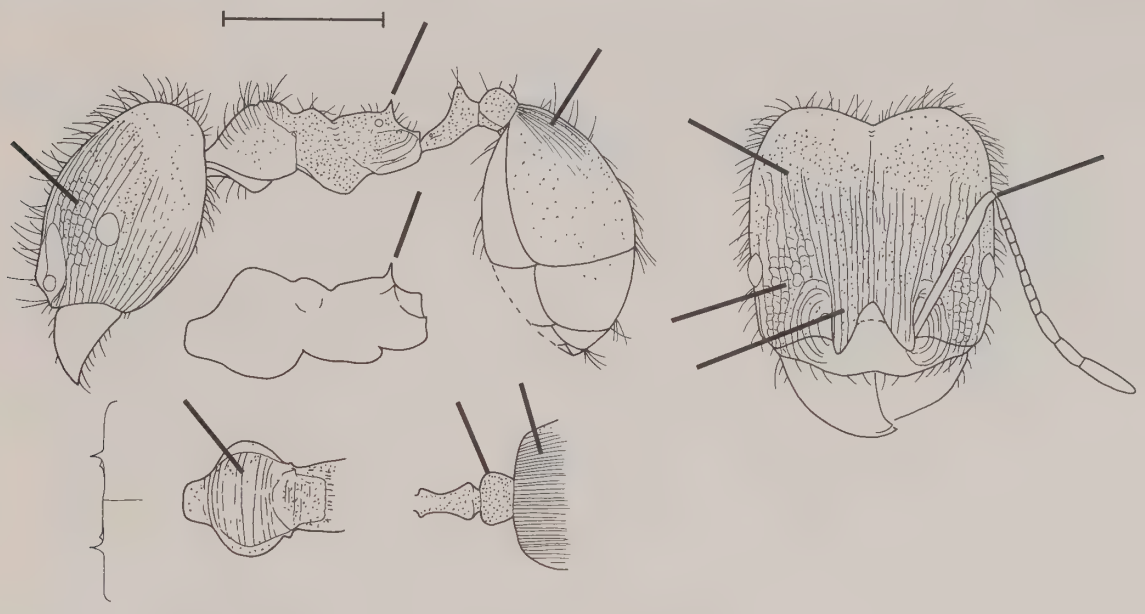
Minor (Huachuca Mts., Arizona): HW 0.60, HL 0.70, SL 0.86, EL 0.14, PW 0.40.

COLOR Major and minor: concolorous light reddish yellow to medium or dark brown.

RANGE *P. hyatti* is scarce in Colorado, where Gregg (1963) found it at only two localities. It also occurs, often locally abundant, from central Texas to southern California and northern Mexico.

BIOLOGY Gregg (1963) encountered the Colorado colonies in warm pockets of short grass prairie at 1700 m, and Cole (1953g) found it in New Mexico in pinyon-juniper woodland at 2000 m. Numerous series I have examined from the southwestern United States, many collected and annotated by Stefan Cover, are from nests in open soil and beneath stones and cow pats in a wide range of xeric habitats, from desert grassland to open juniper-oak woodland. Similar habitat records have been published for Utah by Ingham (1959) and Allred (1982) and for Nevada by G. C. and J. N. Wheeler (1986g). Winged queens have been found in nests from 4 July to 7 August. Droual has described the remarkably efficient maneuvers of nest defense and evacuation by *hyatti* colonies under attack by army ants *(Neivamyrmex nigrescens)*. Droual and Topoff (1981) have shown that emigrations to new sites occur at a high frequency even under apparently stable environmental conditions. The species needs closer study to investigate the possibility that it is a complex of sibling species, in which case the biological data will have to be sorted out for accuracy.

FIGURE Unique holotype, major. BRAZIL: Ceará (M. E. Simon). Minor not seen. Scale bar = 1 mm.



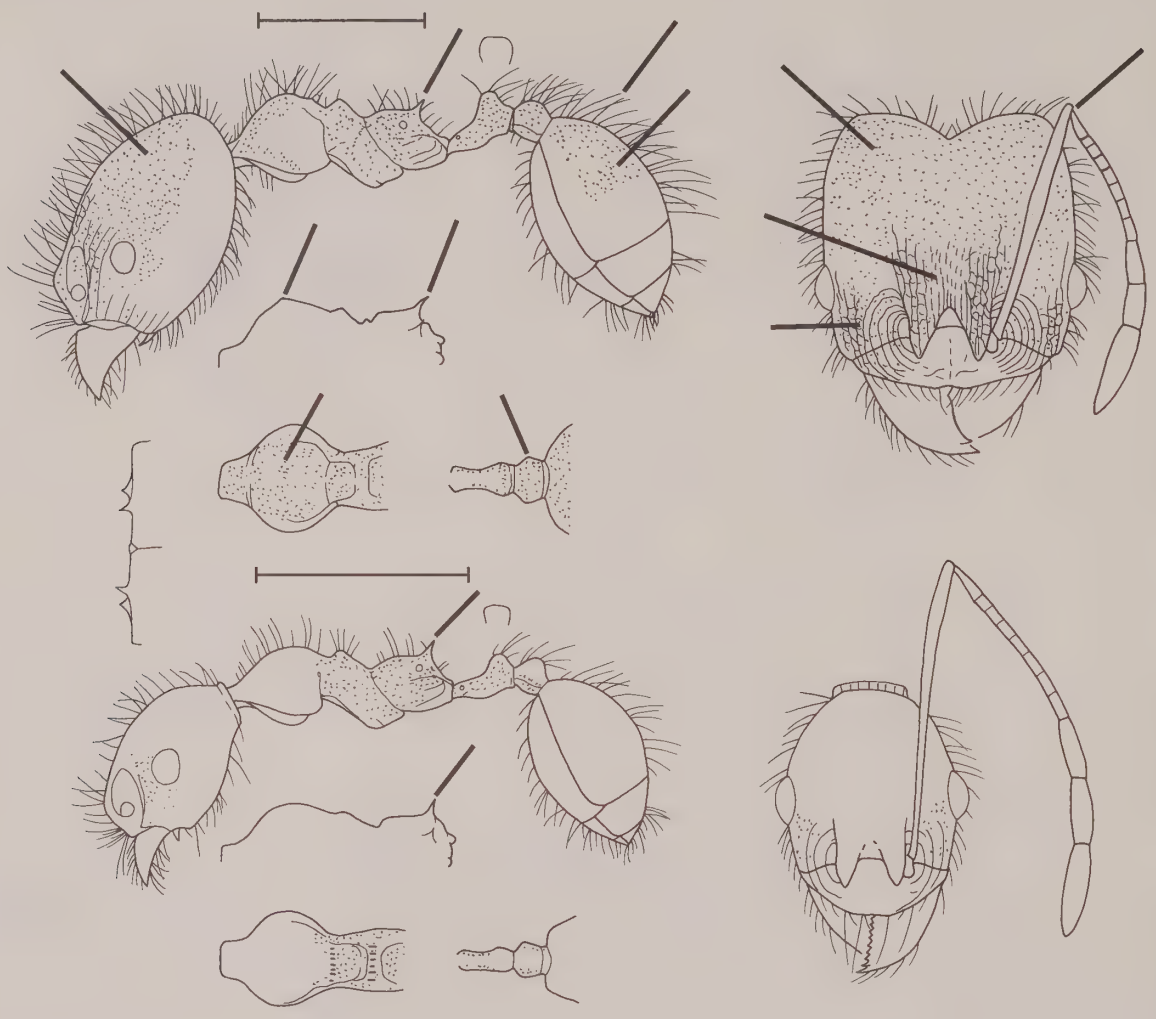
Pheidole impressa Mayr

Pheidole impressa Mayr 1870b: 985. Not seen, and status unknown: *Pheidole impressa* var. *detrita* Emery 1890b: 66 (type locality: San Esteban, Venezuela).

TYPES Naturhist. Mus. Wien.
ETYMOLOGY L *impressa,* marked by impression, possibly referring to the gastral striae.
DIAGNOSIS A very distinct member of the *fallax* group, easily distinguished as follows.
Major: anterior third of central strip of first gastral tergite longitudinally striate; the whole gastral tergite shagreened; rugoreticulum on each side of head stretches from eye medially to antennal fossa and anteriorly to near the anterior border of head; propodeal spines moderately long and nearly vertical to basal propodeal face; promesonotal dorsum transversely carinulate; all of cephalic dorsum, mesosoma, and waist foveolate and feebly shiny to opaque; postpetiolar node from above trapezoidal.
Minor not seen.
MEASUREMENTS (mm) Holotype major: HW 1.36, HL 1.68, SL 0.92, EL 0.22, PW 0.70.
COLOR Major: body and mandibles medium reddish brown, other appendages light reddish brown.
RANGE Known from Ceará and the neighboring state of Rio Grande do Norte, in northeastern Brazil (Kempf 1972b).
BIOLOGY Unknown.

Compare with *haskinsorum, hector*, *petrensis*

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: 3–5 km east of Turrialba (William L. Brown). Scale bars = 1 mm.

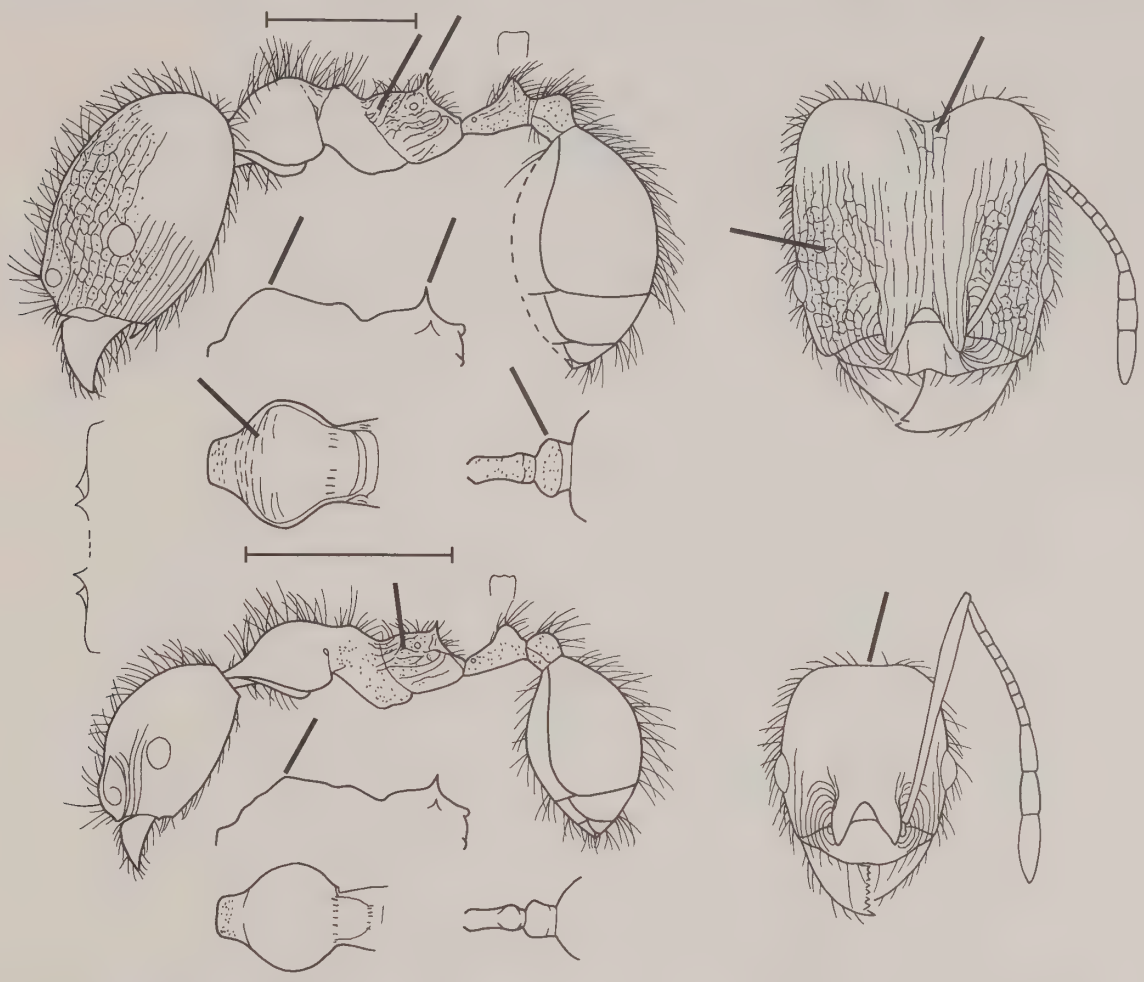


Pheidole indagatrix **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *indagatrix,* huntress.
DIAGNOSIS A member of the *fallax* group with some similarities to *haskinsorum, hector,* and *petrensis,* distinguished as follows.
Major: antennal scape surpasses occipital corner by about its own maximum width; frontal lobes mostly rugoreticulate; pilosity dense and long over all the body, many hairs longer than Eye Length; rugoreticula mesad to each eye extend most of the way to the anterior border of head; all of posterior half of dorsal surface of head punctate and opaque, as well as most of pronotum; anterior half of central strip of first gastral tergite shagreened; propodeal spines long and thin; postpetiole from above diamond-shaped.
Minor: propodeal spines long and thin; pilosity dense, with many hairs as long as Eye Length; occiput narrow, with nuchal collar.
MEASUREMENTS (mm) Holotype major: HW 1.18, HL 1.26, SL 1.10, EL 0.20, PW 0.60.
Paratype minor: HW 0.60, HL 0.80, SL 1.04, EL 0.20, PW 0.42.
COLOR Major: body and mandibles medium reddish brown; gaster medium brown; legs and antennae light reddish brown except for the tarsi, which are yellow.
Minor: body and mandibles medium reddish brown; rest of appendages yellowish brown.
RANGE A common species in Costa Rica from Meseta Central northward, up to 1500 m (Longino 1997).
BIOLOGY According to Longino (1997), *indagatrix* occurs in moist to wet forests, both on the ground and in the canopy, and forages both day and night. It is equally flexible in nesting sites, with colonies having been found variously in and under dead wood on the ground, and in one case each, under accreted soil on the side of a tree trunk and in a hollow live stem. Winged males have been found in nests in January and March.

Compare with *chiapasana, dentata, humeridens, laeviventris, madrensis, maja, tetroides*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. URUGUAY: Montevideo. Scale bars = 1 mm.



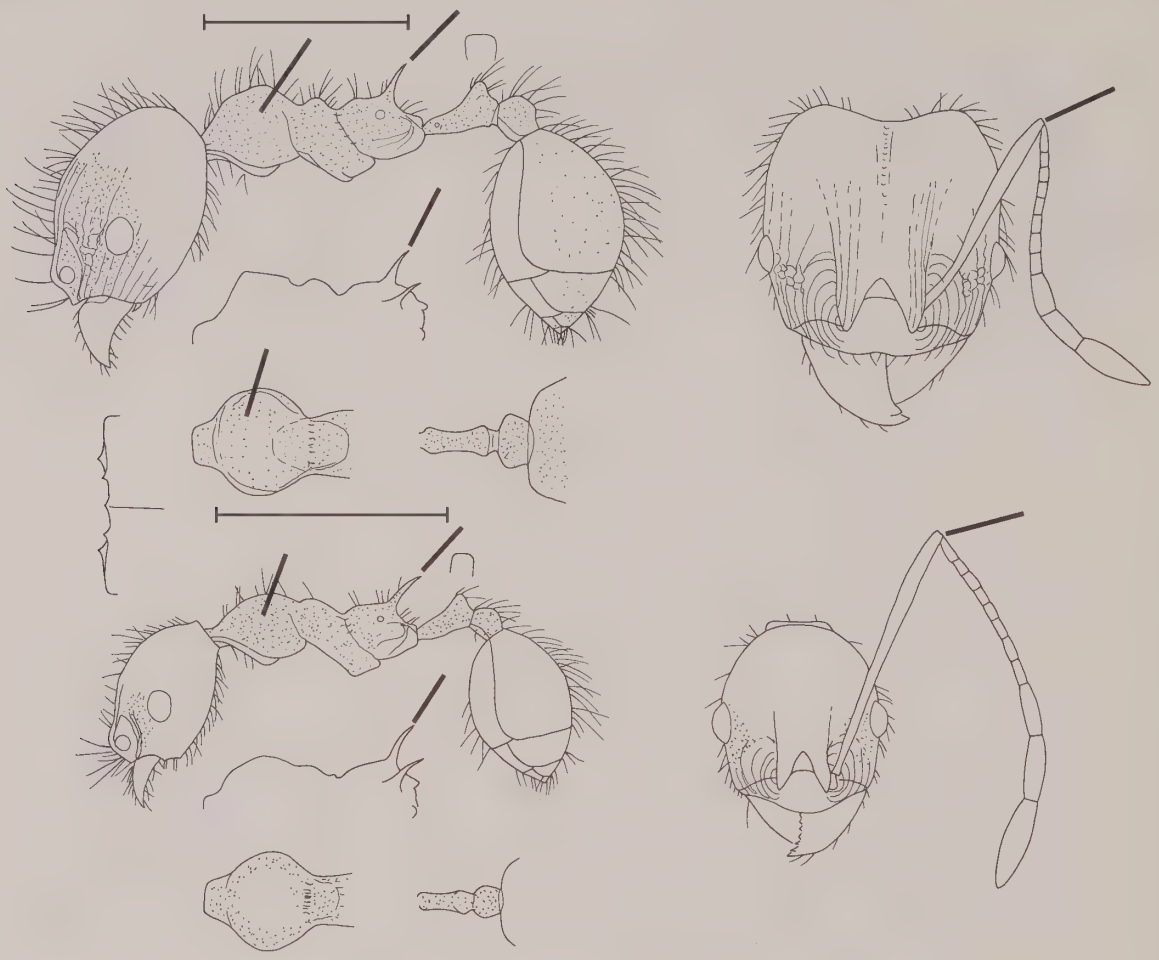
Pheidole industa Santschi, **new status**

Pheidole rufipilis st. *industa* Santschi 1939e: 316.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY Unknown, possibly L *industria,* busy, active.
DIAGNOSIS A member of the *fallax* group similar in various characters to the species listed in the heading above, differing as follows.
Major: rugoreticulum on sides of head covering most of genae and extending posteriorly to halfway between eyes and occipital border; carinulae originating on frontal lobes extend all the way to occiput, where they become a small patch of rugoreticulum; antennal scapes reach posteriorly well beyond midpoint from eye to occipital corner; sides of propodeum rugulose-carinulate; profile of pronotum in dorsal-oblique view elevated well above that of mesonotal convexity, and smoothly convex; propodeal spines long and vertical to basal propodeal face; postpetiole from above elliptical.
Minor: sides of propodeum rugulose-carinulate; humerus subangulate in side view; occiput in full-face view flat.
MEASUREMENTS (mm) Lectotype major: HW 1.60, HL 1.60, SL 1.08, EL 0.24, PW 0.80.
Paralectotype minor: HW 0.80, HL 0.86, SL 1.04, EL 0.20, PW 0.48.
COLOR Major: concolorous light reddish (almost yellowish) brown.
Minor: concolorous medium brown.
RANGE Known only from type locality.
BIOLOGY Unknown.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: vicinity of Benjamin Constant, Amazonas. Scale bars = 1 mm.



Pheidole jaculifera **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *jaculifera,* javelin-bearer, referring to the long, slender propodeal spines.

DIAGNOSIS A small, light brown member of the *fallax* group with extremely long propodeal spines, exceptionally long scapes, and with almost all of the mesosoma foveolate and opaque, in both major and minor.

Similar to *ajax, fiorii, hector,* and *lourothi,* but differing in many details of body form, sculpturing, and pilosity, as illustrated.

MEASUREMENTS (mm) Holotype major: HW 0.92, HL 0.96, SL 0.88, EL 0.20, PW 0.50.

Paratype minor: HW 0.50, HL 0.66, SL 0.84, EL 0.16, PW 0.36.

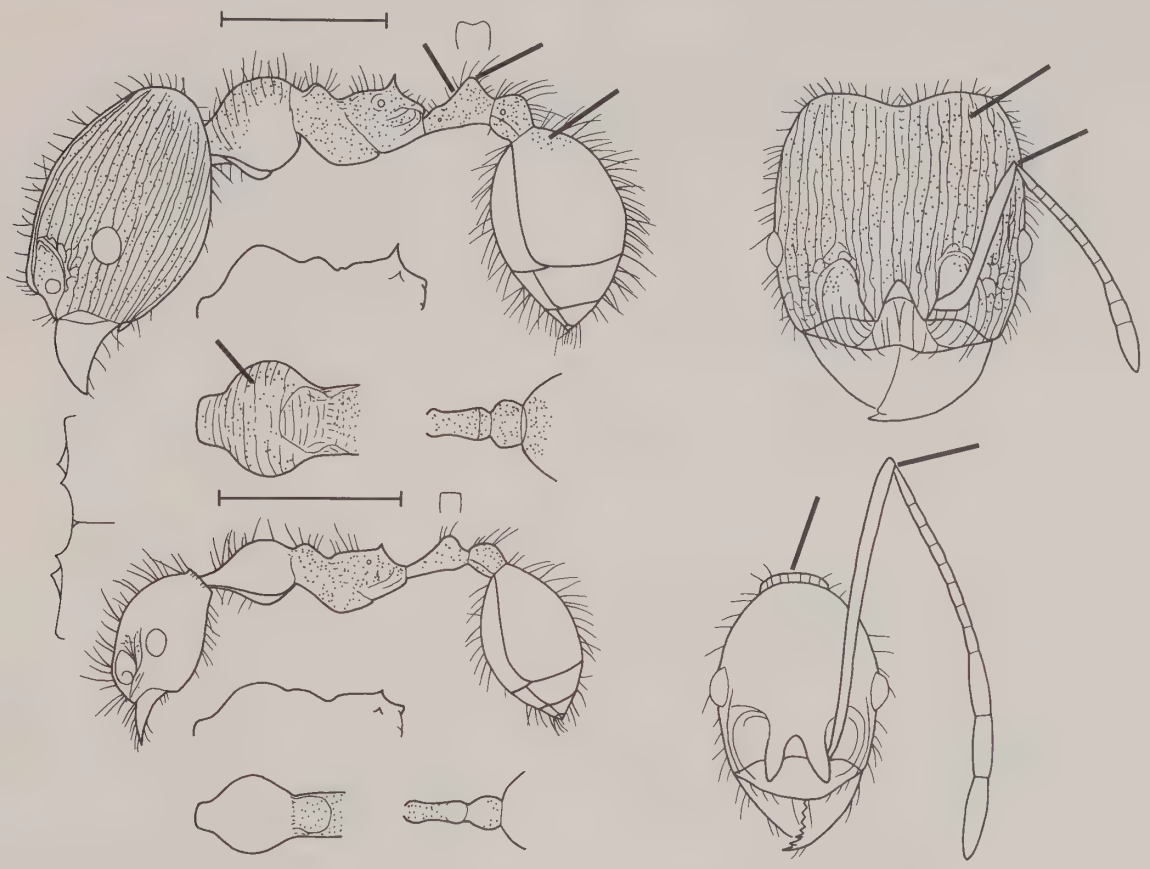
COLOR Major: body concolorous light brown, appendages yellowish brown.

Minor: body concolorous light brown, appendages yellowish brown.

RANGE Known only from the type locality.

BIOLOGY Unknown.

FIGURE Upper: unique holotype, major (Cayenne, French Guiana, collected by "M. Jelski"). Lower: minor (Cuzco Amazónico, near Puerto Maldonado, Madre de Dios, Peru, associated with major compared with lectotype). Scale bars = 1 mm.

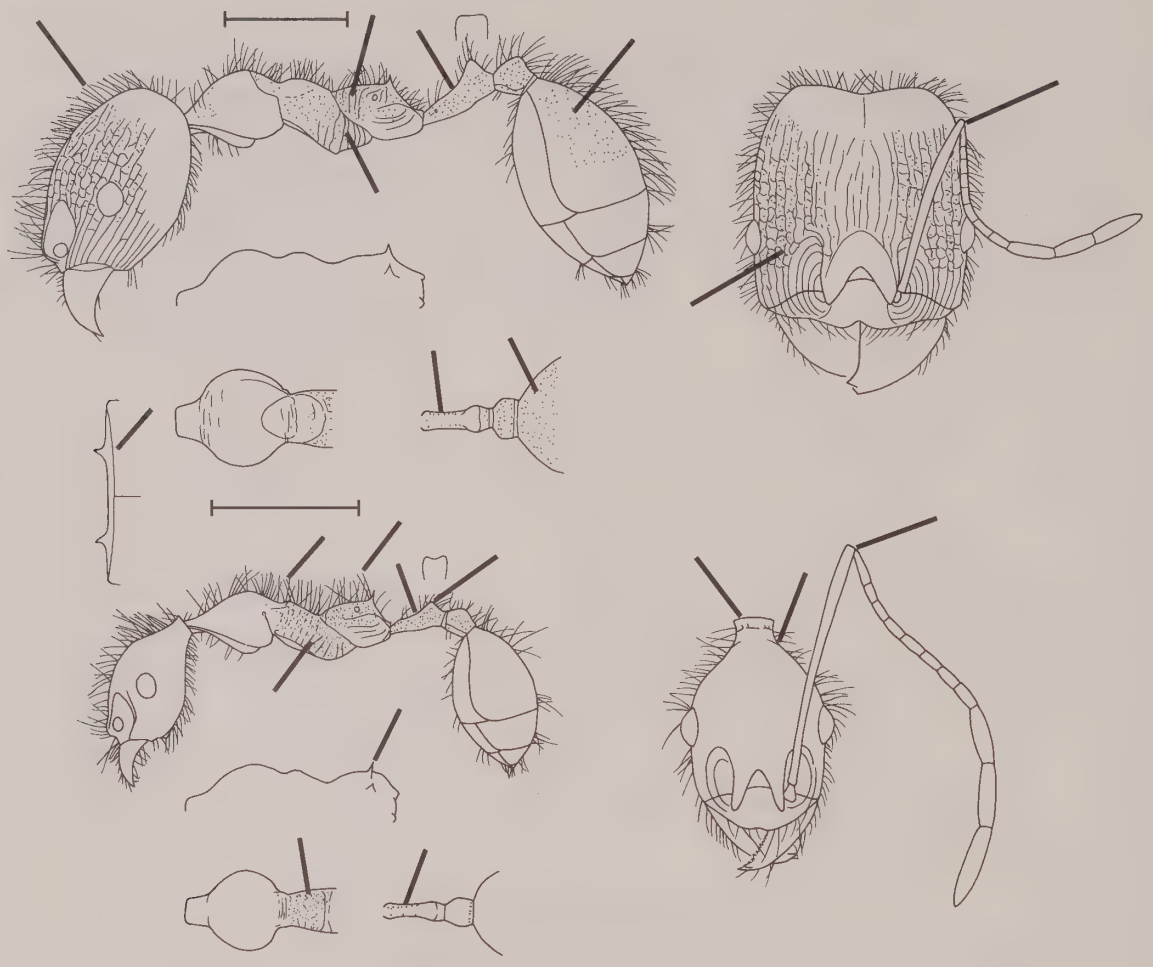


Pheidole jelskii Mayr, **new status**

Pheidole jelskii Mayr 1884: 34. Syn.: *Pheidole jelskii* var. *arenicola* Emery 1894h: 390, n. syn.; *Pheidole fallax* r. *emiliae* Forel 1901j: 352, n. syn.; *Pheidole jelskii* var. *antillensis* Forel 1901j: 356, n. syn.; *Pheidole fallax* subsp. *emiliae* var. *retifera* Emery 1906c: 155, unavailable name (quadrinomial).

TYPES Naturhist. Mus. Wien.
ETYMOLOGY Named after the collector, M. Jelski.
DIAGNOSIS A member of the *fallax* group, similar to *fallax, obscurithorax, puttemansi, roushae, tobini,* and *valens,* and especially the common and widespread *fallax,* with which it is easily confused.
Major: posterior half of dorsal surface of head completely carinulate; pronotum transversely carinulate; anterior fourth to third of central strip of first gastral tergite shagreened; head tapered toward occiput in side view, as depicted.
P. jelskii differs from *P. fallax* as follows and as shown: in **major**, petiole distinctly lower and descending to the peduncle by a much less concave curve, and scapes longer (Scape Length/Head Width 0.60–0.70 as opposed to 0.50–0.59 in *fallax* major); and in **minor**, occiput much narrower and nuchal collar thinner than in *fallax*.
MEASUREMENTS (mm) Holotype major: HW 1.48, HL 1.54, SL 1.00, EL 0.24, PW 0.80.
Minor (Cuzco Amazónico, Madre de Dios, Peru): HW 0.56, HL 0.76, SL 1.00, EL 0.20, PW 0.42.
COLOR Major: body medium reddish brown, mandibles dark reddish brown.
Minor: body and most of appendages dark brown, often almost blackish brown, tarsi and mandibles light brown.
RANGE Widespread throughout the West Indies, thence south through South America to southeastern Brazil and northern Argentina.
BIOLOGY *P. jelskii* is a species that nests in bare soil and open spaces. As such it is well adapted to disturbed habitats of all kinds, from cultivated fields to pastures to roadsides, as well as marginal natural environments such as beaches and river banks. In many places it is extremely abundant, although colony densities vary locally. In the early 1890s H. H. Smith (in Forel 1893j) encountered it only twice on St. Vincent, which given the intensity of his collecting, suggests relative rarity, whereas in the 1990s Stefan Cover and I found it ubiquitous and in dense populations in the nearby islands of Grenada and Barbados. Mature colonies are large, with worker populations numbering into the many hundreds or even thousands. They typically construct conspicuous crater nests with slit-shaped entrances in open soil, but also less regular nests with irregular entrances in vertical banks of soil in heavily disturbed locations. The minors forage singly over distances of up to ten meters or more, and are extremely swift and efficient at laying odor trails over even very loose soil to recruit other minors as well as majors to dead insects and sugar baits. The majors release a strong fetid odor, possibly from skatole, when the colonies are disturbed.

FIGURE Upper: major (associated with minors compared with lectotype minor). BRAZIL: Sarramento, Minas Gerais. Lower: lectotype, minor. ARGENTINA: Jujuy. Scale bars = 1 mm.

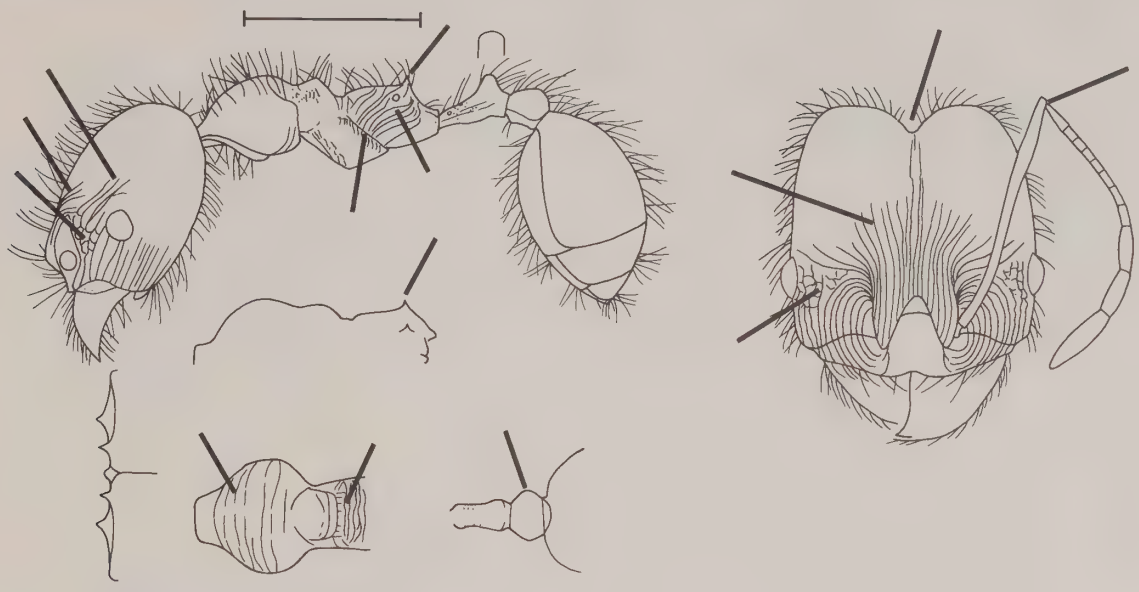


Pheidole jujuyensis Forel

Pheidole oxyops r. *jujuyensis* Forel 1913m: 229. Raised to species level by Kempf 1964e: 62.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY Named after the Argentine state of origin.
DIAGNOSIS A member of the *"jujuyensis* complex" of the larger *fallax* group, comprising *araneoides, cuevasi, durionei, jujuyensis, kugleri, leonina, leptina, lucretii, lupus, paraensis, punctithorax, tijucana, wallacei,* and *wolfringi,* which complex is characterized in both major and minor by slender body form and exceptionally long scapes and petiolar pedicel; also in the major by a proportionally small head; and in the minor by a strongly developed nuchal collar. *P. jujuyensis* is distinguished as follows.
Major: scape fails to reach occipital corner by more than its own maximum width; pronotal dorsum smooth and shiny; mesopleuron and sides of propodeum transversely carinulate; first gastral tergite mostly shagreened and opaque.
Minor: occiput thinned into a neck; mesopleuron carinulate.
Both major and minor are extremely pilose, with abundant, exceptionally long, erect hairs on all appendages.
MEASUREMENTS (mm) Major: HW 1.66, HL 1.80, SL 1.50, EL 0.26, PW 0.84.
Lectotype minor: HW 0.64, HL 0.90, SL 1.52, EL 0.20, PW 0.50.
COLOR Major: body mostly medium brown with slight reddish tinge; mandibles, pronotal dorsum, mesothorax, propodeum, and waist dark plain brown.
Minor: head and mesosoma dark reddish brown; appendages, waist, and gaster light reddish brown.
RANGE Recorded from Jujuy in northwest Argentina and Minas Gerais in Brazil.
BIOLOGY Unknown.

FIGURE Holotype, major. PERU: 3 km north of Oxacampa, Pasco, 2000 m (Charles Kugler and R. R. Lambert). No minors available. Scale bar = 1 mm.



Pheidole kugleri **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after Charles Kugler, in recognition of his research in myrmecology and his extraordinary collections of *Pheidole* made in Colombia and other parts of South America.

DIAGNOSIS A member of the "*jujuyensis* complex" of the larger *fallax* group, comprising *araneoides, cuevasi, durionei, jujuyensis, kugleri, leonina, leptina, lucretii, lupus, paraensis, punctithorax, tijucana, wallacei,* and *wolfringi*. *P. kugleri* is easily distinguished from the other species by the following traits.

Major: antennal scapes exceed occipital corners by twice their maximum width; carinulae originating on frontal lobes and along frontal carinae spread laterally out to create a fan-like pattern, with those coming from the more anterior parts of the frontal carinae turning almost horizontal to travel toward the sides of the head; rugoreticula on each side of the head extend from the eye to the antennal fossa; occiput narrowed, the nadir of its cleft deep and rounded; promesonotum and all surfaces of the propodeum carinulate. The holotype is more heavily sculptured than the average.

Minor: unknown.

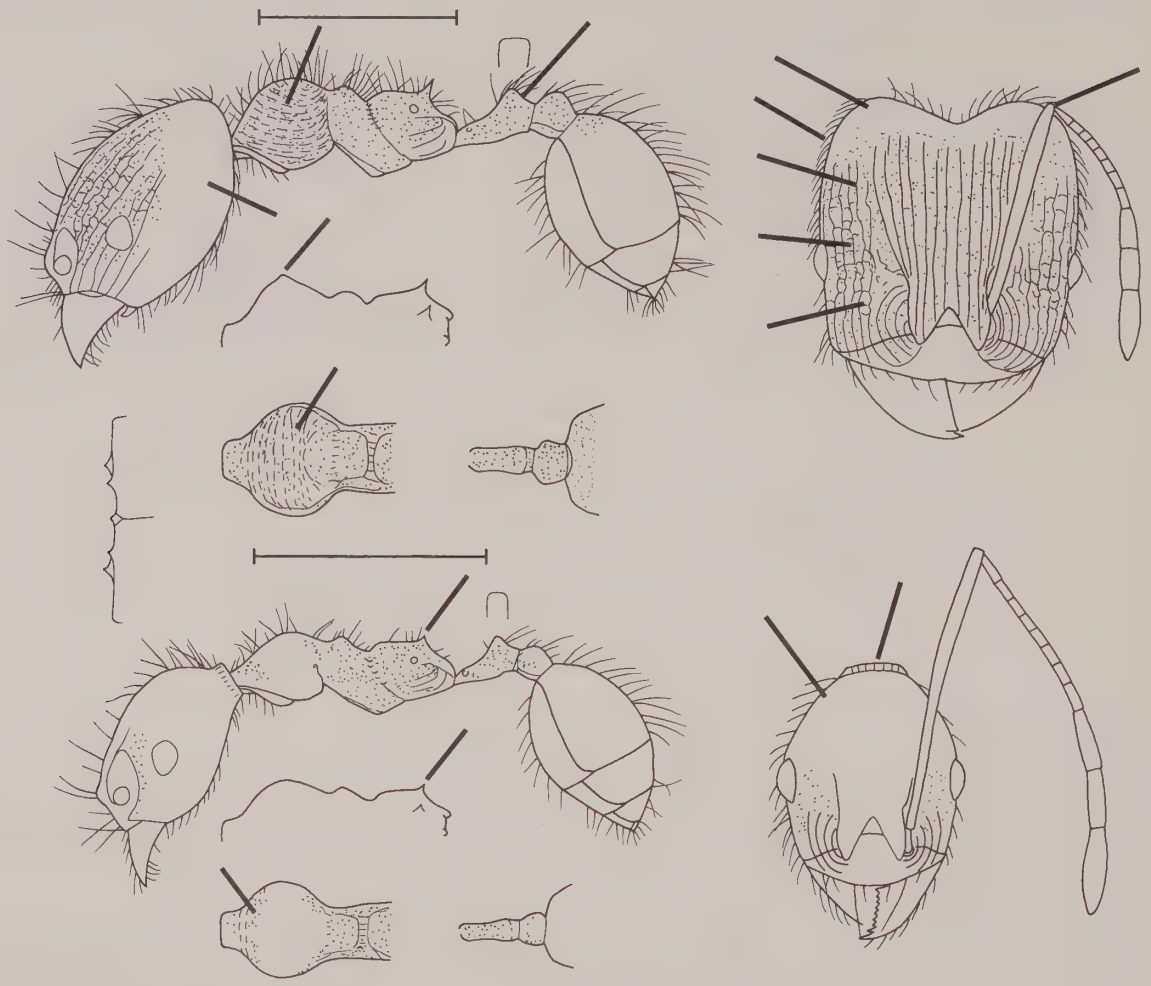
MEASUREMENTS (mm) Holotype major: HW 1.34, HL 1.50, SL 1.34, EL 0.24, PW 0.68.

COLOR Major: body dark brown, appendages medium brown.

RANGE Known only from the type locality.

BIOLOGY The type series was collected from primary forest on a steep hillside above farmland.

FIGURE Upper: holotype, major. Lower: paratype, minor. NICARAGUA: Kukra River (Ivette Perfecto). Scale bars = 1 mm.



Pheidole kukrana **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the type locality.

DIAGNOSIS A member of the *fallax* group close to *caribbaea* and *obscurior,* possibly synonymous with the latter, and somewhat less similar to *cardinalis, mantilla,* and *rubiceps,* distinguished as follows.

Major: dark brown; antennal scape just attaining the occipital corner; humerus angulate in dorsal-oblique view; occiput in frontal view and ventral half of head in side view smooth and shiny; all of pronotum covered by transverse, "wraparound" carinulae; rugoreticulum on head extends on each side from eye to antennal fossa, posteriorly to halfway between eye and occipital corner, and anteriorly to halfway between eye and anterior border of head. Dorsal and lateral surfaces of head coated with dense, long, subdecumbent yellowish hairs.

Minor: occiput drawn into neck, with nuchal collar; propodeal spines reduced to denticles; anterior strip of pronotal dorsum foveolate and opaque.

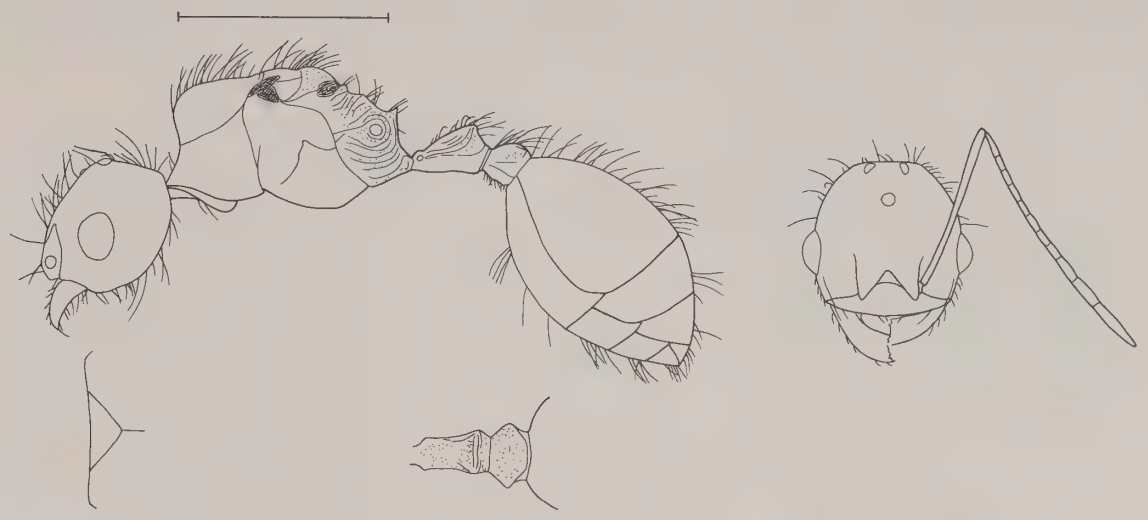
MEASUREMENTS (mm) Holotype major: HW 1.06, HL 1.16, SL 0.98, EL 0.20, PW 0.56.
Paratype minor: HW 0.52, HL 0.66, SL 0.96, EL 0.14, PW 0.36.

COLOR Major: body dark brown, appendages medium brown.
Minor: body medium brown, appendages light to yellowish brown.

RANGE Known from the type locality, from both the Atlantic and Pacific lowlands of Costa Rica (J. T. Longino), and from Venezuela (4 km northeast of Biscucuy, Portuguesa, 670 m; W. L. Brown and J. Lattke).

BIOLOGY In Costa Rica, *kukrana* is very adaptable, occurring in seasonal dry forest, and mature and secondary lowland rainforest, and nesting opportunistically in small cavities both on the ground and in the canopy; it occasionally builds carton walls (Longino 1997).

FIGURE Syntype, queen. ARGENTINA: Parque General San Martin, Entre Rios (N. Kusnezov). Scale bar = 1 mm.



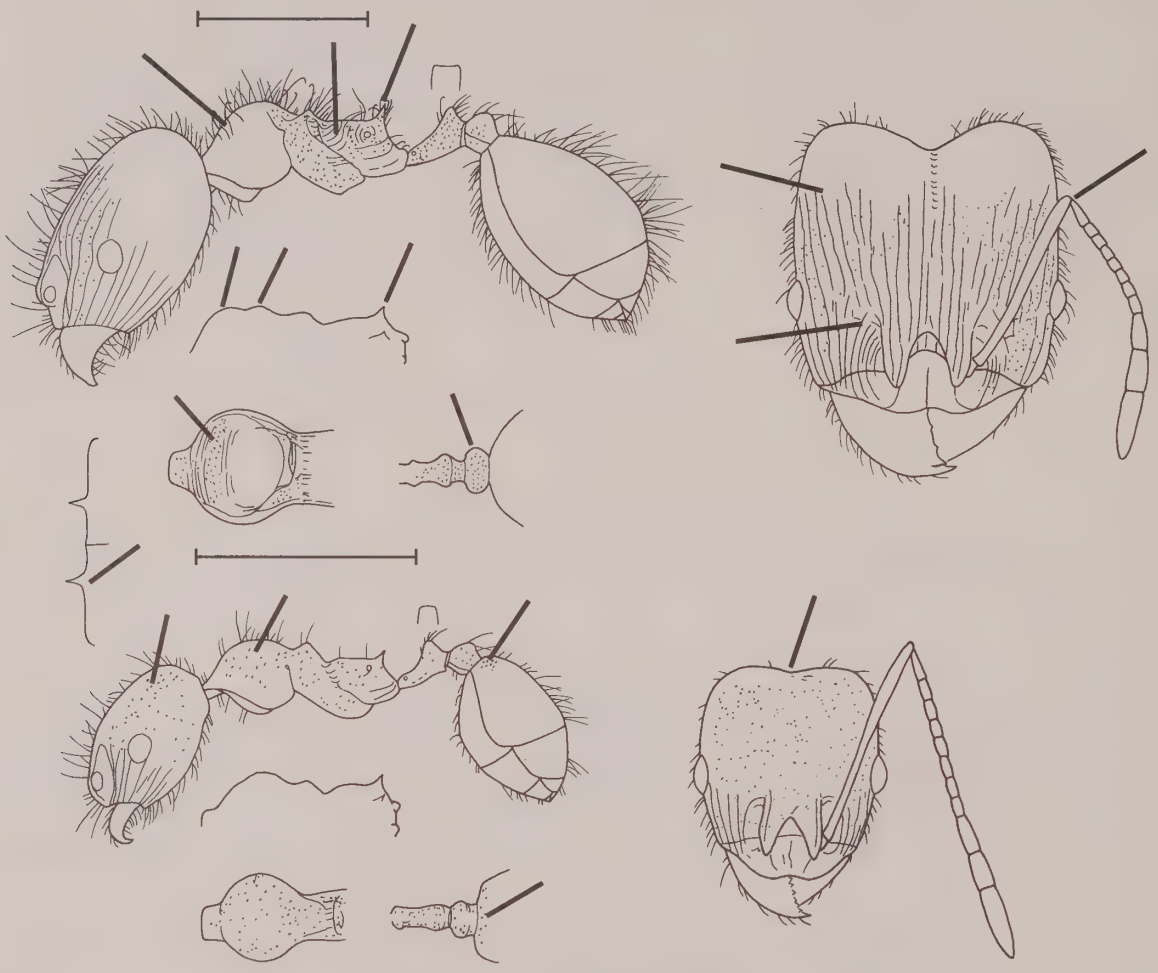
Pheidole kusnezovi, **new name**

Eriopheidole symbiotica Kusnezov 1952d ("1951"): 16. Combination with *Pheidole* by Brown 1973b: 180, creating an unresolved junior homonym of *Pheidole symbiotica* Wasmann 1909a: 515, now resolved with the new name *kusnezovi*.

TYPES Inst. Miguel Lillo, Tucumán; Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after N. Kusnezov, Argentinean entomologist who discovered the species.
DIAGNOSIS A permanent, workerless social parasite of *Pheidole obscurior*. The queen is very small in size, with slender head and large eyes, mostly shiny body surface, subangular petiole in side view, and hexagonal postpetiolar node seen from above. Overall, it has not evolved any of the extreme parasitic traits of other socially parasitic *Pheidole* such as *acutidens, argentina,* and *elecebra*.
MEASUREMENTS (mm) Queen: HW 0.64, HL 0.64, SL 0.78, EL 0.24, PW (not measured).
COLOR Queen: appendages, anterior half of the head, and most of the sides of the mesosoma yellow; rest of head and body a contrasting light brown.
RANGE Known only from the type locality.
BIOLOGY Kusnezov's (1952a) field and laboratory research showed that *Pheidole inquilina* is a workerless inquiline of *P. obscurior*. He correctly pointed out that the queen represents an early stage of the kind of degenerative anatomy that characterizes ant inquilines in general.

Compare with *chiapasana, dentata, humeridens, industa, madrensis, maja, tetroides*

FIGURE Upper: syntype, major. Lower: syntype, minor. MEXICO: Cuernavaca, Morelos (W. M. Wheeler). (Type locality: Aguascalientes, Aguascalientes.) I have compared the specimens on which the drawing is based, which are located in the Museum of Comparative Zoology, Harvard, with syntypes in the Forel collection from the type locality. Scale bars = 1 mm.

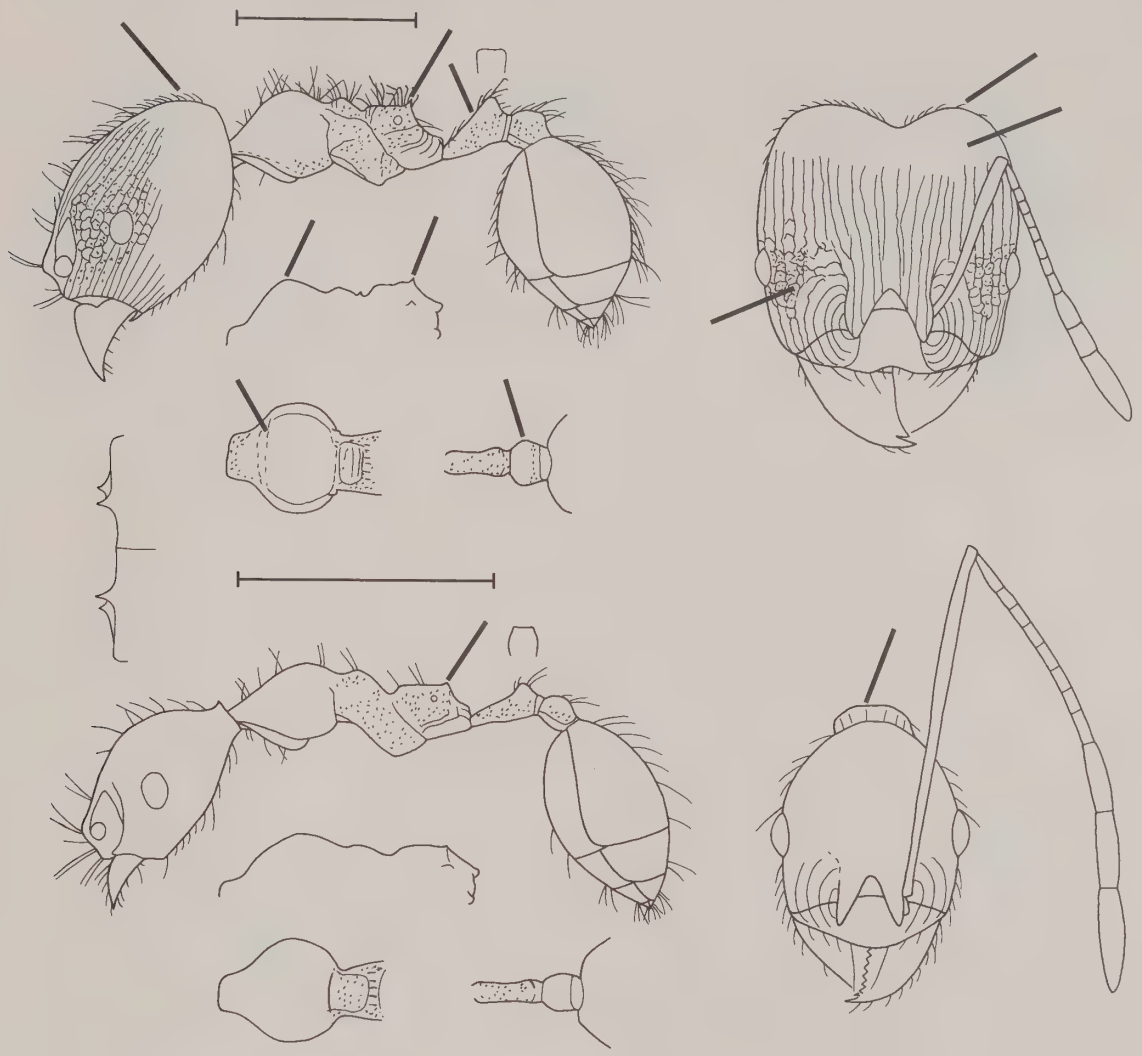


Pheidole laevivertex Forel

Pheidole laevivertex Forel 1901d: 131.

TYPES Mus. Hist. Nat. Genève; Mus. Comp. Zool. Harvard.
ETYMOLOGY L *laevivertex,* smooth top, referring to occiput.
DIAGNOSIS A member of the *fallax* group similar in various characters to the species listed in the heading above, and distinguished as follows.
Major: rugoreticulum confined to a small patch just posterior to the circular carinulae of the antennal fossae; carinulae of head reaching slightly posterior to midway between the eyes and occiput; anterior half of pronotal dorsum and all of propodeal dorsum transversely carinulate; pronotal profile in dorsal-oblique view bilobous; postpetiole from above oval, and foveolate.
Minor: all of head, mesosoma, and waist foveolate and opaque; anterior strip of first gastral tergite shagreened; occiput in frontal view concave.
MEASUREMENTS (mm) Syntype major: HW 1.14, HL 1.22, SL 0.82, EL 0.20, PW 0.60.
Syntype minor: HW 0.60, HL 0.70, SL 0.78, EL 0.14, PW 0.40.
COLOR Major: concolorous medium reddish brown.
Minor: body and scapes dark reddish brown, rest of appendages brownish yellow.
RANGE Known only from Aguascalientes and Morelos, Mexico.
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cuzco Amazónico, 15 km northwest of Puerto Maldonado, Madre de Dios (Stefan Cover and John E. Tobin). Scale bars = 1 mm.

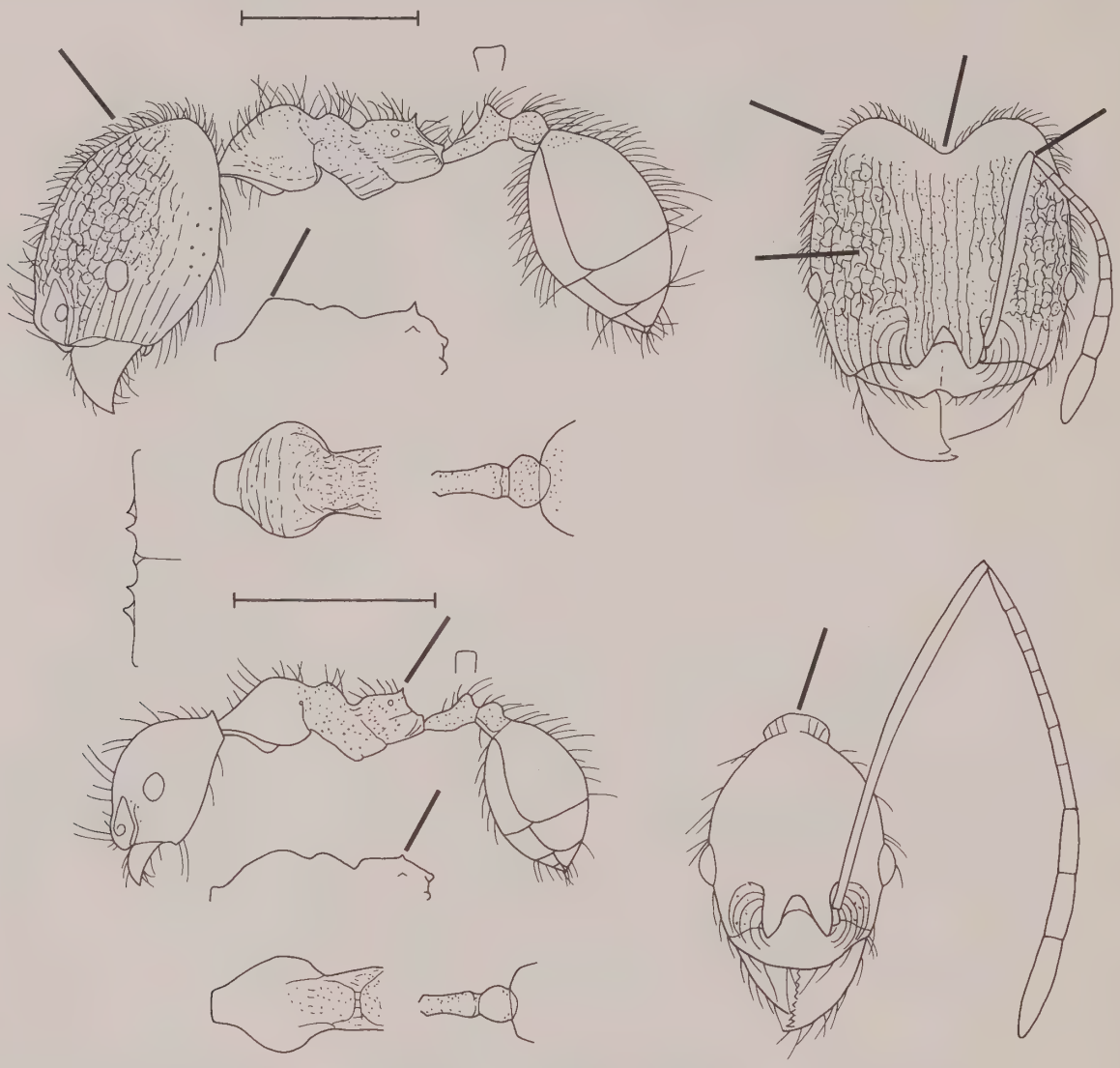


Pheidole laniger **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *laniger,* wool-bearing.
DIAGNOSIS A member of the *fallax* group, similar to *lovejoyi* (but also scan *alienata, cardinalis, caribbaea, fallax, jelskii, lattkei, mantilla, obscurior, petrensis, puttemansi, rubiceps, roushae, susannae, tobini*), and distinguished as follows.
Major: posterior dorsal profile of head lined by uniform felt of short, subrecumbent hairs; propodeal spine reduced to denticle; occiput smooth; rugoreticulum limited to spaces around eye; dorsal face of petiolar peduncle in side view straight; pronotum bare of carinulae.
Minor: head narrowed posteriorly, nuchal collar present; propodeal spine reduced to denticle.
MEASUREMENTS (mm) Holotype major: HW 1.26, HL 1.34, SL 0.90, EL 0.20, PW 0.60.
Paratype minor: HW 0.50, HL 0.70, SL 0.98, EL 0.14, PW 0.38.
COLOR Major: concolorous brownish yellow.
Minor: body and appendages light brownish yellow, head a slightly contrasting medium brownish yellow.
RANGE In addition to the type series, I have seen a larger, darker variant, and possibly distinct species, with more extensive cephalic reticulation on the major, from near San Cristóbal, Tachira, Venezuela, collected by J. Lattke.
BIOLOGY The type colony was found in terra firme rainforest, in a root mass at the base of a palm tree.

Compare with *haskinsorum, obscurior, petrensis, susannae*

FIGURE Upper: holotype, major. Lower: paratype, minor. VENEZUELA: Cerro Humo via Las Melenas, 9.7 km northwest of Irapa, Sucre, 10°4′N 62°37′W, 950 m (John Lattke). Scale bars = 1 mm.



Pheidole lattkei **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the collector, the Venezuelan entomologist John Lattke.

DIAGNOSIS A member of the *fallax* group, most similar to *haskinsorum, obscurior, petrensis,* and *susannae,* distinguished as follows.

Major: tip of antennal scape fails to reach occipital corner by slightly more than 2× the maximum scape width; head in side and frontal views tapers narrowly toward occiput; occipital cleft deep, and subangular at nadir; posterior dorsum of head covered by dense, suberect, forward curving hairs of medium length; occiput smooth; in full-face view, central strip of cephalic dorsum longitudinally carinulate, and lateral thirds rugoreticulate; in dorsal-oblique view, humerus subangulate.

Minor: nuchal collar present, propodeal spines reduced to denticles.

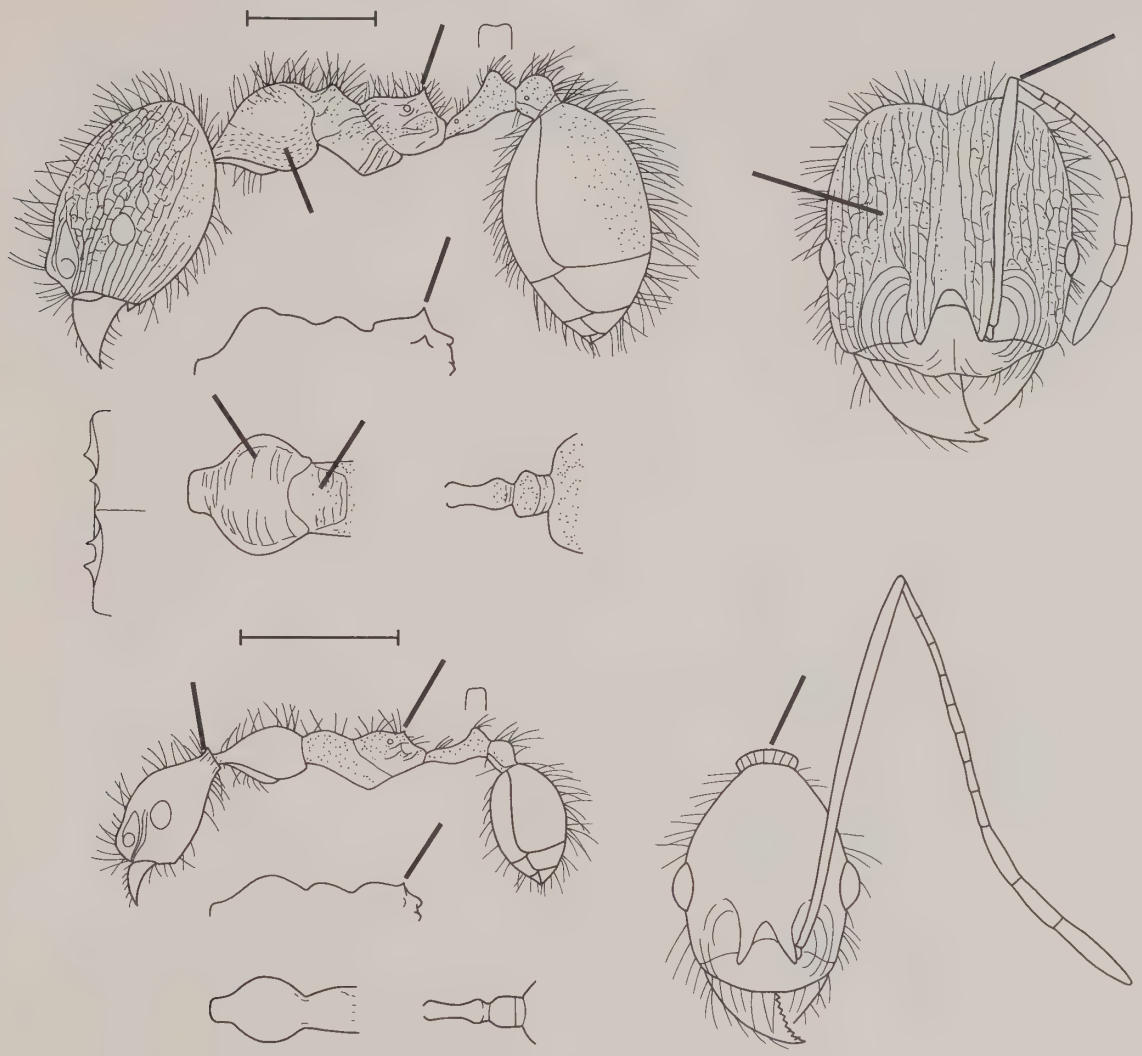
MEASUREMENTS (mm) Holotype major: HW 1.30, HL 1.48, SL 1.12, EL 0.20, PW 0.60.
Paratype minor: HW 0.56, HL 0.80, SL 1.18, EL 0.14, PW 0.40.

COLOR Major: concolorous light reddish brown.
Minor: concolorous reddish yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios (Stefan Cover). Scale bars = 1 mm.



Pheidole leonina **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *leonina,* lion-like.

DIAGNOSIS A member of the "*jujuyensis* complex" of the larger *fallax* group, comprising *araneoides, cuevasi, durionei, jujuyensis, kugleri, leonina, leptina, lucretii, lupus, paraensis, punctithorax, tijucana, wallacei,* and *wolfringi*. *P. leonina* is distinguished as follows.

Major: occiput narrowed in full-face view; antennal scape exceeding occipital corner by more than its own maximum width; rugoreticulum on each side of dorsum of head in full-face view extends from anterior margin of head to edge of occiput, where it is replaced by rugulae; propodeal spines stout, short, equilaterally triangular; all of central strip of first gastral tergite shagreened.

Minor: propodeal spines reduced to denticles; occiput drawn into thin neck, with nuchal collar.

MEASUREMENTS (mm) Holotype major: HW 1.52, HL 1.60, SL 1.44, EL 0.30, PW 0.82.
Paratype minor: HW 0.62, HL 0.92, SL 1.44, EL 0.22, PW 0.46.

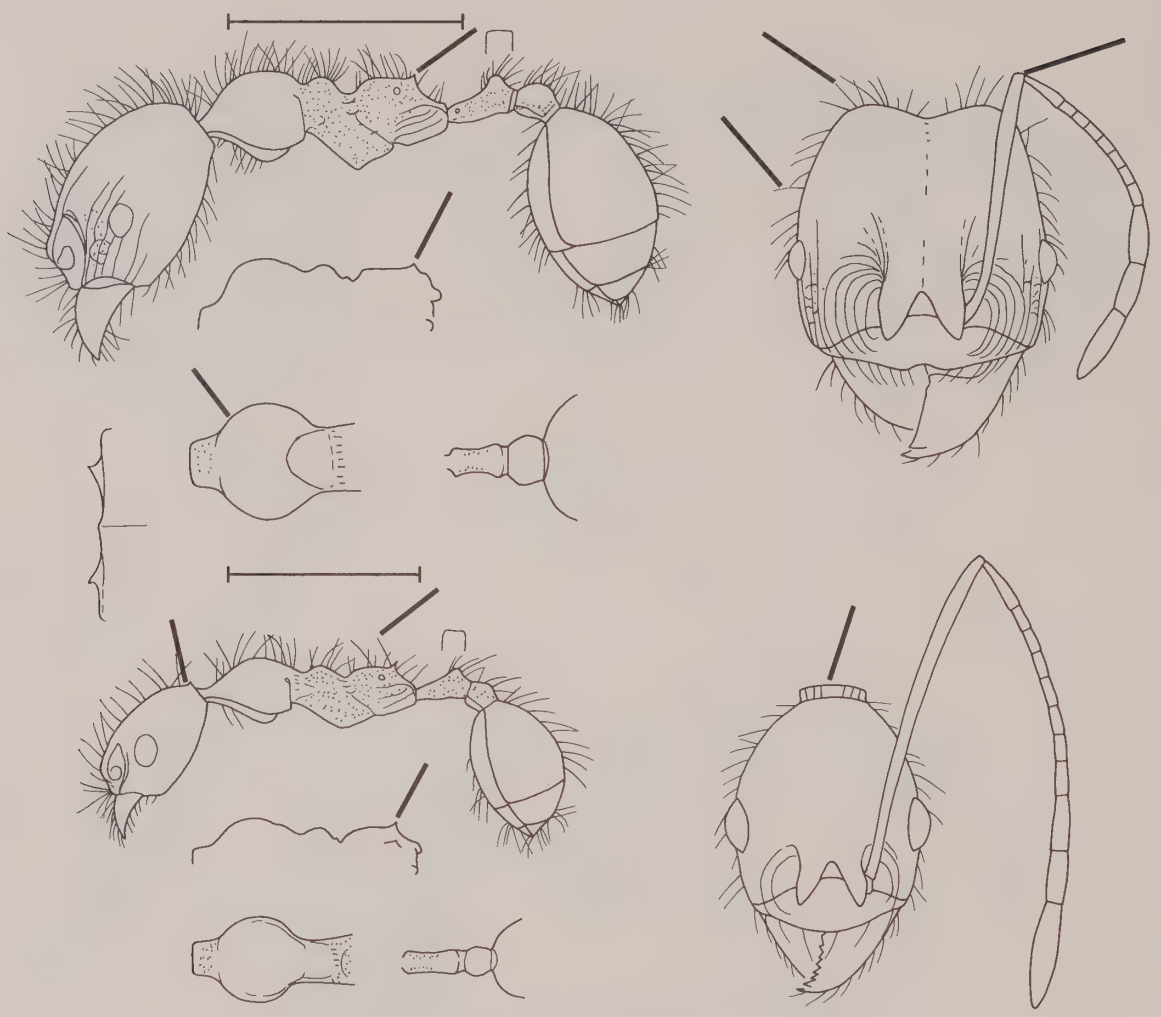
COLOR Major: mandibles light reddish brown, body and antennae light reddish to yellowish brown, legs medium to dark yellow. Minor: concolorous medium yellow.

RANGE Known only from the type locality.

BIOLOGY In terra firme forest, recruiting to dead cockroach.

Compare with *auchena, jujuyensis, punctithorax*

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cocha Cashu Research Station, Madre de Dios, 400 m (Diane W. Davidson). Scale bars = 1 mm.



Pheidole leptina **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *leptina,* thin, slender.

DIAGNOSIS A member of the "*jujuyensis* complex" of the larger *fallax* group, comprising *araneoides, cuevasi, durionei, jujuyensis, kugleri, leonina, leptina, lucretii, lupus, paraensis, punctithorax, tijucana, wallacei,* and *wolfringi,* which complex is characterized in both major and minor by slender body form and exceptionally long antennal scapes and petiolar pedicel; also in the major by a proportionately small head; and in the minor by a strongly developed nuchal collar. *P. leptina* is distinguished as follows.

Major: antennal scape exceeding the occipital corner by more than 2× its own maximum width; head unusually small and occiput narrowed in frontal view; posterior half of head capsule and all of gaster smooth and shiny; propodeal spines reduced to denticles.

Minor: occipital neck only moderately developed; propodeal spines reduced to denticles.

Both castes: body brown, appendages dark yellow.

MEASUREMENTS (mm) Holotype major: HW 0.84, HL 0.94, SL 0.84, EL 0.22, PW 0.50.

Paratype minor: HW 0.52, HL 0.72, SL 0.98, EL 0.18, PW 0.40.

COLOR Major: body uniformly medium brown, appendages brownish yellow.

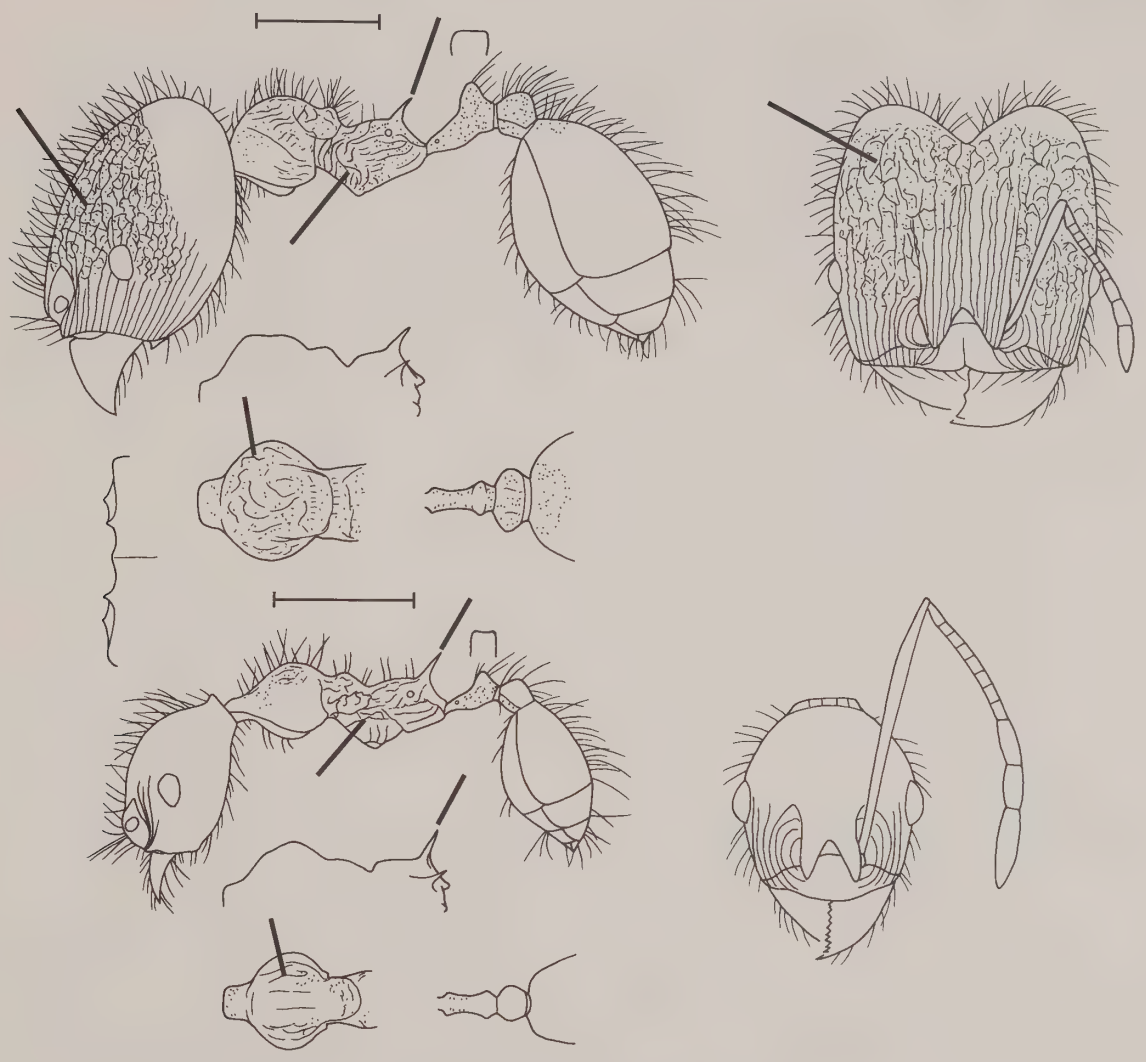
Minor: gaster light brown, rest of body medium brown, appendages dark yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

Compare with *ajax, fiorii, hector, hirsuta, jaculifera*

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: 4 km south-southeast of San Vito, Puntarenas (Philip S. Ward). Scale bars = 1 mm.



Pheidole lourothi **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named in honor of Louis M. Roth, distinguished insect systematist and friend, who accompanied me on my first field trip to Costa Rica in 1959.

DIAGNOSIS A very large blackish (**major**) or reddish (**minor**) brown member of the *fallax* group, distinguished in the major by its long propodeal spines, largely rugoreticulate dorsal head surface, and almost completely rugulose and carinulate sides of the mesosoma; and in the minor by the rugulose mesopleuron and propodeum.

Similar to *ajax, fiorii, hector, hirsuta,* and *jaculifera,* differing in many details of body form, sculpturing, and pilosity, as illustrated.

MEASUREMENTS (mm) Holotype major: HW 1.88, HL 1.80, SL 1.04, EL 0.30, PW 0.84.

Paratype minor: HW 0.78, HL 0.92, SL 1.16, EL 0.22, PW 0.60.

COLOR Major: body blackish brown, head also with a faint reddish tinge; mandibles dark reddish brown; scape and legs except tarsi medium brown; funiculus and tarsi brownish yellow.

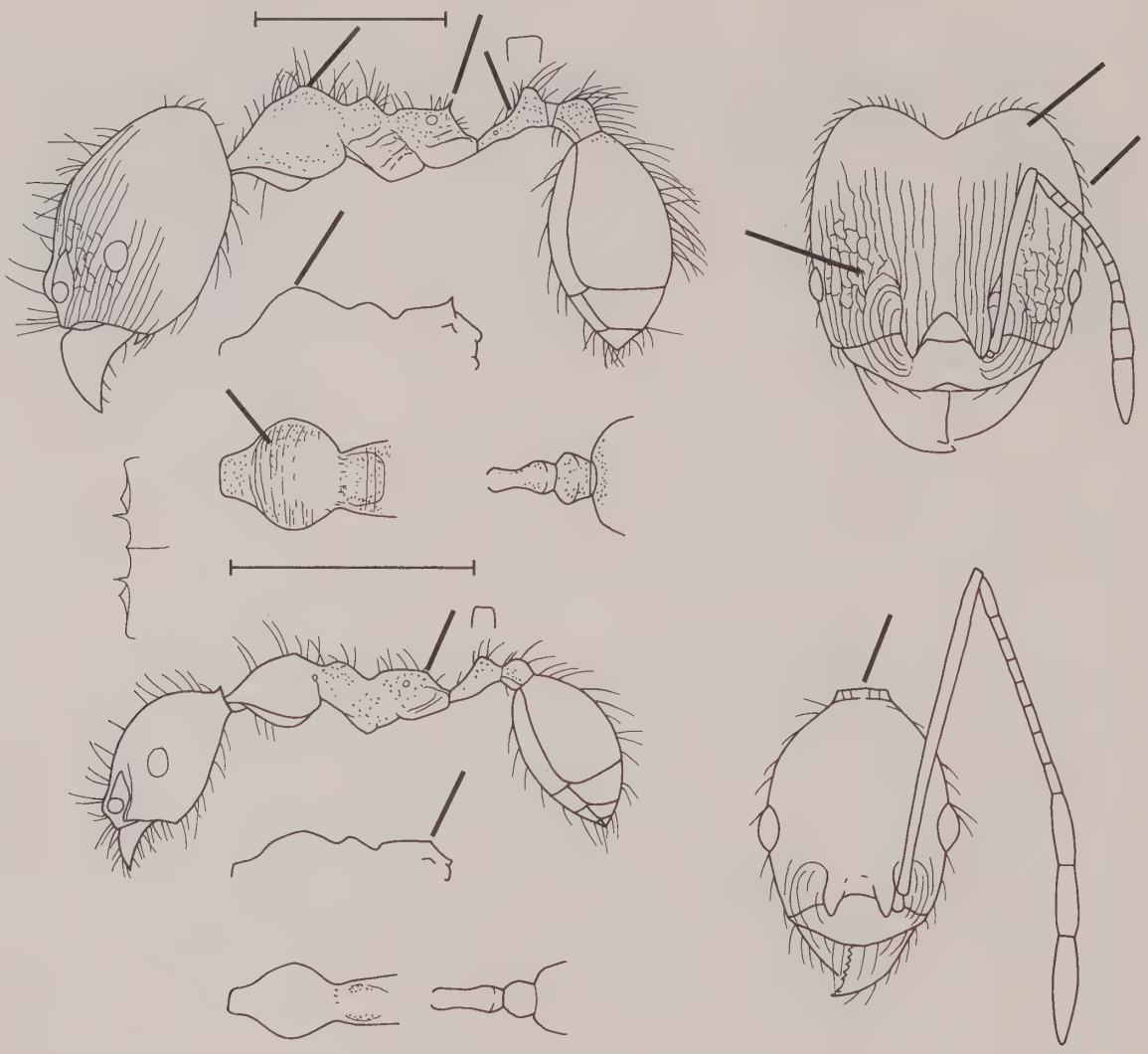
Minor: gaster dark brown, rest of body medium reddish brown; appendages light reddish brown.

RANGE Known only from the type locality.

BIOLOGY The type colony was collected by Philip S. Ward from a rotten log on the floor of rainforest.

Compare with *laniger*

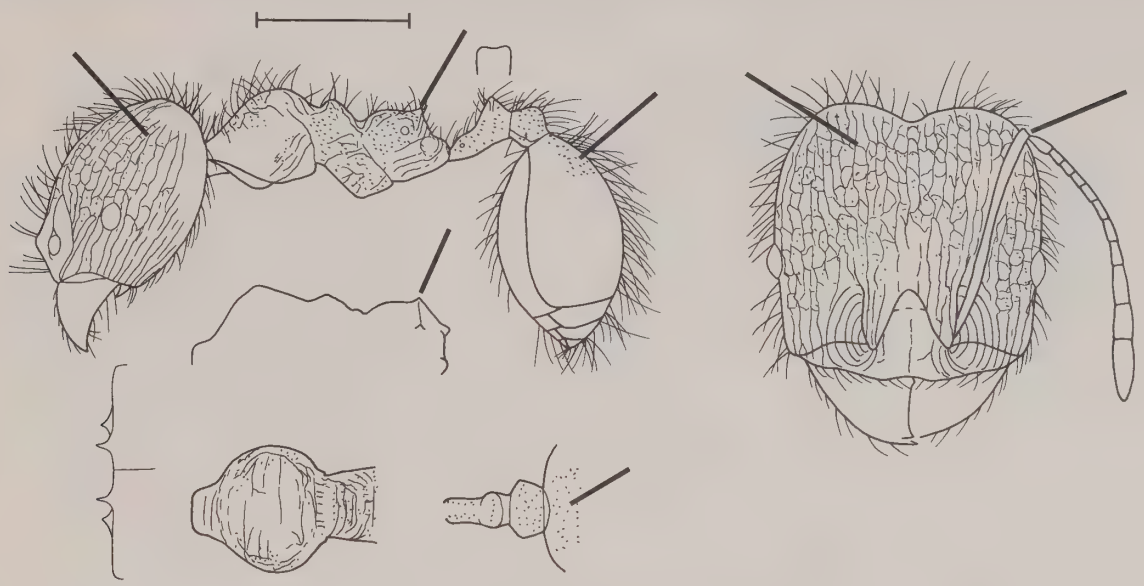
FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: Fazenda Dimona, Smithsonian Institution Field Station, 90 km north of Manaus, Amazonas (E. O. Wilson). Scale bars = 1 mm.



Pheidole lovejoyi **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after Thomas E. Lovejoy, distinguished field biologist and my host at Fazenda Dimona.
DIAGNOSIS A member of the *fallax* group, most similar to *laniger* (but also scan *alienata, cardinalis, caribbaea, fallax, jelskii, lattkei, mantilla, obscurior, petrensis, puttemansi, rubiceps, roushae, susannae, tobini*), distinguished by the following combination of traits.
Major: in full-face view, profile of head posterior to eyes fringed by short, subrecumbent hairs of uniform length; in side view, center of pronotal dorsal profile raised as a low convexity; petiolar peduncle slender, its dorsal border concave in side view; pronotal dorsum partly carinulate; anterior strip of first gastral tergite foveolate and opaque.
Minor: nuchal collar present; propodeal spine reduced to obtuse angle.
MEASUREMENTS (mm) Holotype major: HW 1.42, HL 1.50, SL 1.04, EL 0.20, PW 0.66.
Paratype minor: HW 0.46, HL 0.64, SL 0.94, EL 0.12, PW 0.34.
COLOR Major: head reddish brown, mesosoma plain medium brown, gaster and appendages plain light brown.
Minor: head medium brownish yellow, appendages and rest of head medium brownish yellow.
RANGE Known only from the type locality.
BIOLOGY In lowland rainforest.

FIGURE Lectotype, major. BRAZIL: Blumenau, Santa Catarina. (Minor unknown.) Scale bar = 1 mm.



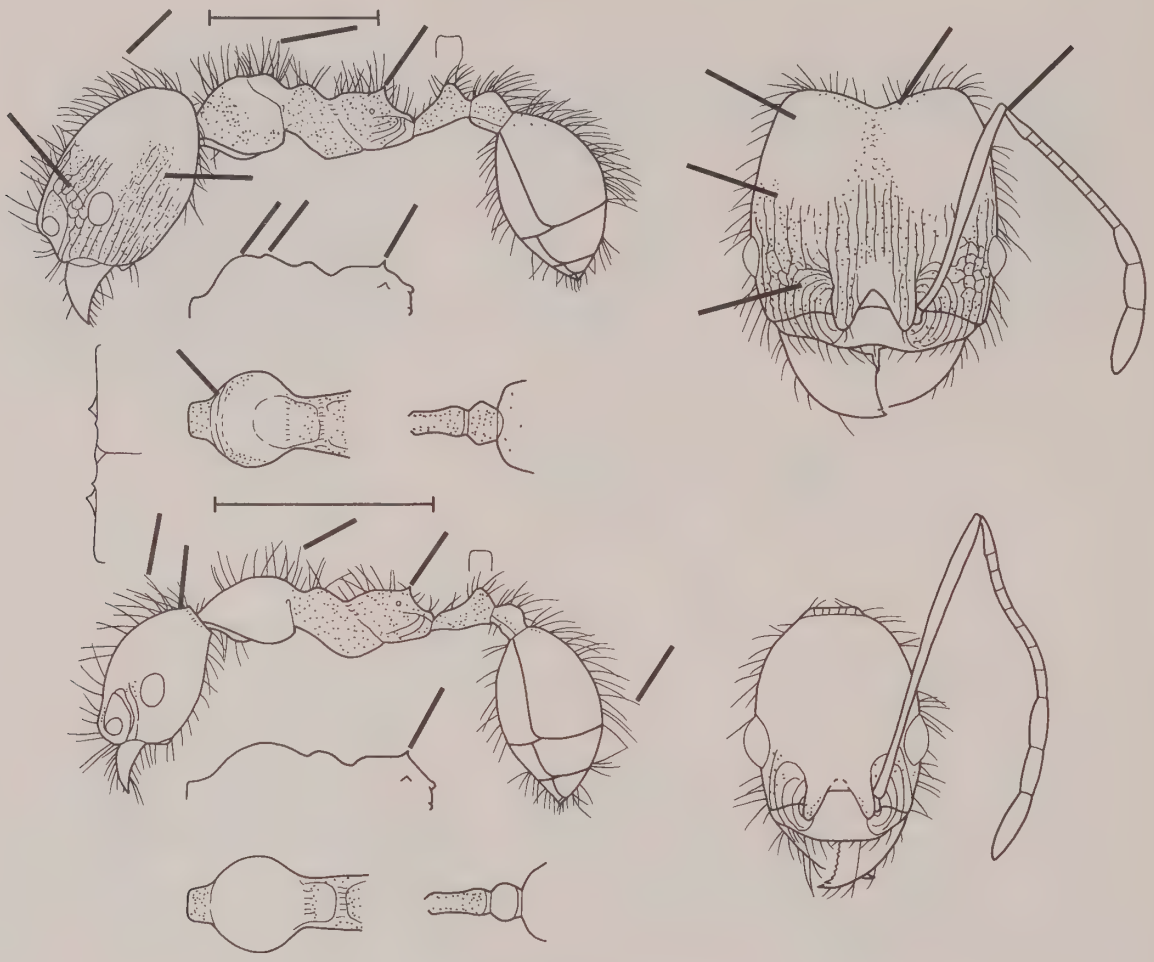
Pheidole lucretii Santschi

Pheidole lucretii Santschi 1923d: 45.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY Eponymous.
DIAGNOSIS A member of the "*jujuyensis* complex" of the larger *fallax* group, comprising *araneoides, cuevasi, durionei, jujuyensis, kugleri, leonina, leptina, lucretii, lupus, paraensis, punctithorax, tijucana, wallacei,* and *wolfringi*. *P. lucretii* is distinguished as follows.
Major: head quadrate; antennal scape just attaining the occipital border; space from eyes to antennal fossae, and all of the posterior dorsal half of the head, including the occiput, rugoreticulate; propodeal spines reduced to denticles; anterior fourth of central strip of first gastral tergite shagreened.
Minor: unknown.
MEASUREMENTS (mm) Major: HW 1.54, HL 1.54, SL 1.12, EL 0.24, PW 0.84.
COLOR Major: head, mesosoma, and appendages medium reddish brown; waist and gaster plain medium brown.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Estácion Biologica de Cocha Cashu, Madre de Dios, 400 m (Diane W. Davidson). Scale bars = 1 mm.



Pheidole lupus **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *lupus,* wolf.

DIAGNOSIS A member of the "*jujuyensis* complex" of the larger *fallax* group, comprising *araneoides, cuevasi, durionei, jujuyensis, kugleri, leonina, leptina, lucretii, lupus, paraensis, punctithorax, tijucana, wallacei,* and *wolfringi*. *P. lupus* is distinguished as follows.

Major: antennal scape just reaches occipital corner; rugoreticulum on each side of head runs in a swath from eye to antennal fossa; carinulae extend no further than halfway from level of eye to level of occiput; in full-face view occiput and narrow zone running from it around midline foveolate; pronotal dorsal profile in dorsal-oblique view bilobate; propodeal spines small, equilaterally triangular; pilosity very dense and long, many hairs as long as Eye Length.

Minor: pilosity very dense and long, many hairs as long as Eye Length; propodeal spines reduced to denticles; occiput drawn into neck, with nuchal collar.

MEASUREMENTS (mm) Holotype major: HW 1.16, HL 1.28, SL 1.06, EL 0.24, PW 0.64.
Paratype minor: HW 0.54, HL 0.74, SL 1.00, EL 0.20, PW 0.40.

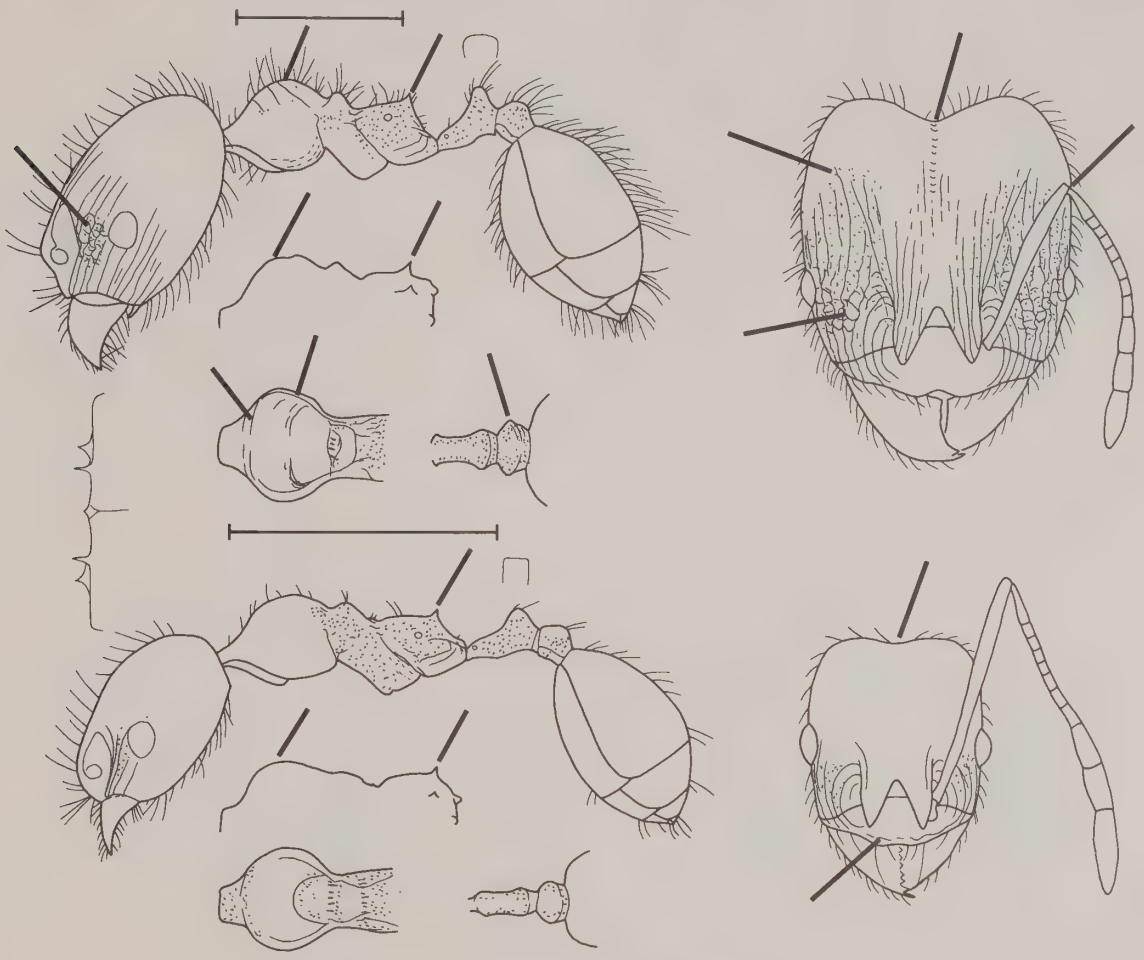
COLOR Major: body dark brown except for head anterior to eyes, which is medium reddish brown; mandibles medium reddish brown; other appendages yellowish brown.
Minor: body medium brown; appendages light brown except for tarsi, which are yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

Compare with *chiapasana, dentata, humeridens, industa, laevivertex, maja, tetroides*

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: 120 km south of Creel, Barranca de Rio Batopilas, Chihuahua, 1000 m (W. Bell and J. Reddell). Scale bars = 1 mm.



Pheidole madrensis **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *madrensis,* referring to the Sierra Madre Occidental, the mountains of origin of the type colony.

DIAGNOSIS A member of the *fallax* group similar in various traits to the species listed in the heading above, distinguished as follows.

Major: propodeal spines equilaterally triangular in side view; rugoreticulum of head a band from eye to antennal fossa; carinulae on head extend more than halfway from level of eyes to level of occiput; occipital margin in full-face view strongly convex; dorsal pronotal profile in dorsal-oblique view faintly bilobous; postpetiole from above elliptical, with angulate lateral borders; anterior and lateral pronotal margins carinulate.

Minor: a rugula stretches across the anterior rim of the middle clypeal segment; propodeal spines equilaterally triangular in side view; pronotum smoothly convex in dorsal-oblique view; occiput shallowly convex.

MEASUREMENTS (mm) Holotype major: HW 1.24, HL 1.36, SL 0.84, EL 0.20, PW 0.66.

Paratype minor: HW 0.64, HL 0.74, SL 0.84, EL 0.18, PW 0.44.

COLOR Major: body light reddish brown, appendages dark yellow.

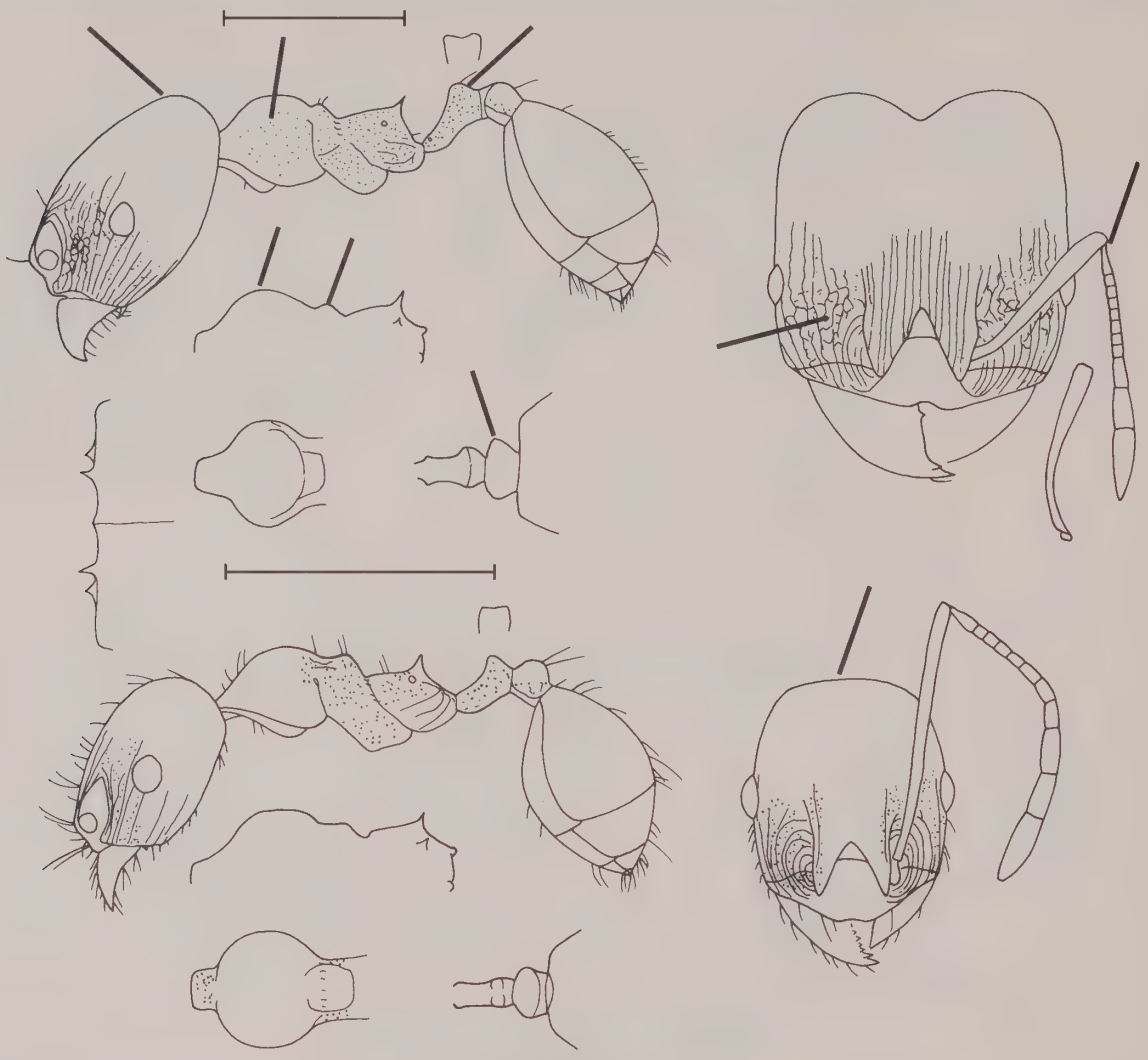
Minor: body rich dark reddish brown, antennae plain medium brown, other appendages reddish yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

Compare with *chiapasana, dentata, humeridens, industa, laevivertex, madrensis, tetroides*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. GUATEMALA: Ciudad de Guatemala. Scale bars = 1 mm.

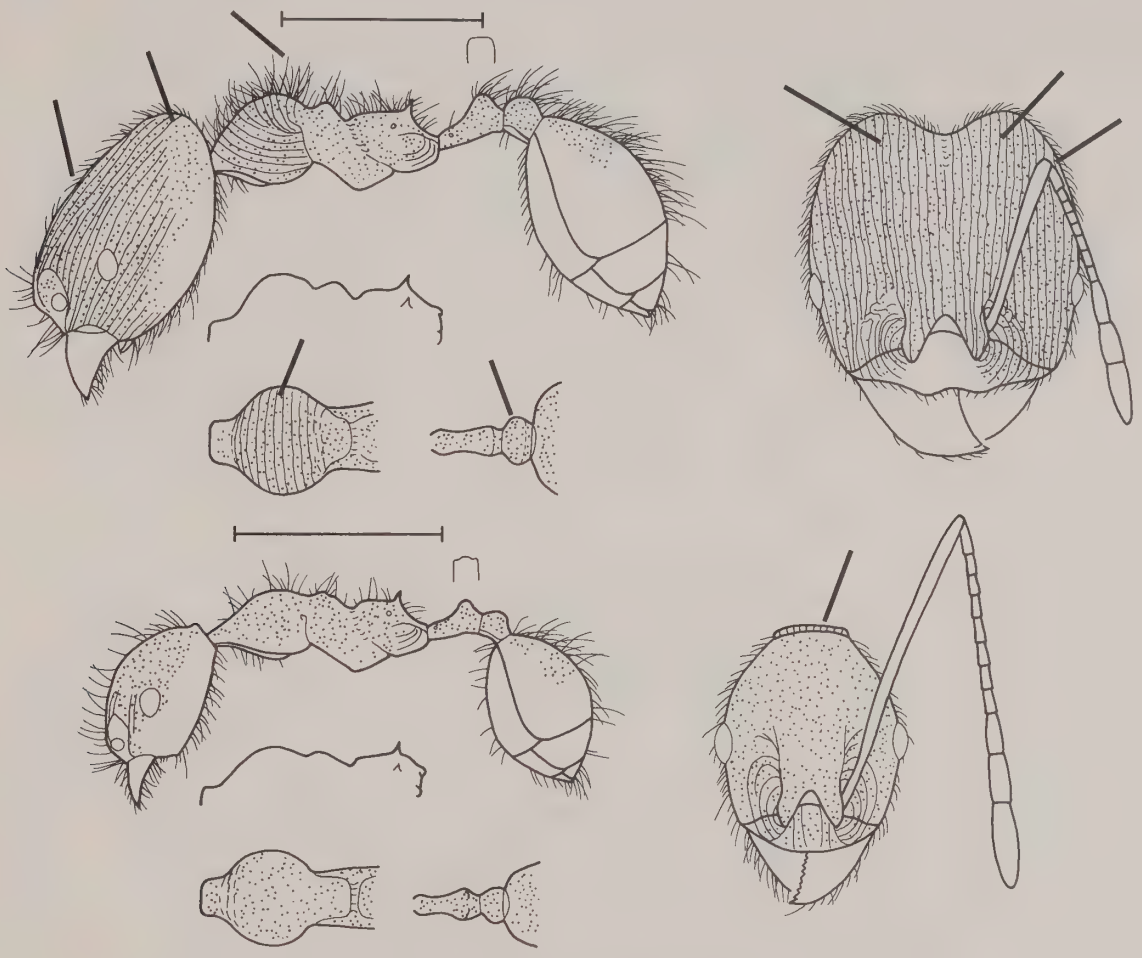


Pheidole maja Forel

Pheidole major Forel 1886b: xvliii.

TYPES Mus. Hist. Nat. Genève; Mus. Comp. Zool. Harvard.
ETYMOLOGY Possibly Gr *maia,* good mother, nurse.
DIAGNOSIS A member of the *fallax* group somewhat similar to the species listed in the heading above, distinguished as follows.
Major: very sparse pilosity, with no hairs on full-face profile (types may be degraded); head elliptical in profile, narrowing conspicuously in side view; in dorsal-oblique view, pronotal profile smoothly convex; petiolar node in side view low; postpetiole from above trapezoidal; sides of pronotum sparsely foveolate.
Minor: occipital margin in full-face view convex; carinulae present along lateral margins of frontal lobes.
MEASUREMENTS (mm) Lectotype major: HW 1.22, HL 1.30, SL 0.80, EL 0.22, PW 0.62.
Paralectotype minor: HW 0.62, HL 0.74, SL 0.82, EL 0.14, PW 0.44.
COLOR Major: concolorous light reddish brown.
Minor: concolorous plain medium brown.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Pita, on road to Monteverde, Puntarenas, 200 m (J. T. Longino). Scale bars = 1 mm.



Pheidole mantilla **new species**

TYPES INBio.

ETYMOLOGY L *mantilla,* cloak, referring to the dense pilosity of the head and mesosoma.

DIAGNOSIS Closely similar to *caribbaea* of Jamaica, differing in the **major** in its narrower occiput seen in full-face view; carinulae of the cephalic dorsum reaching all the way to the occiput border; shorter scape; oval (rather than trapezoidal) postpetiole; and lighter (reddish-yellow as opposed to brown) color.

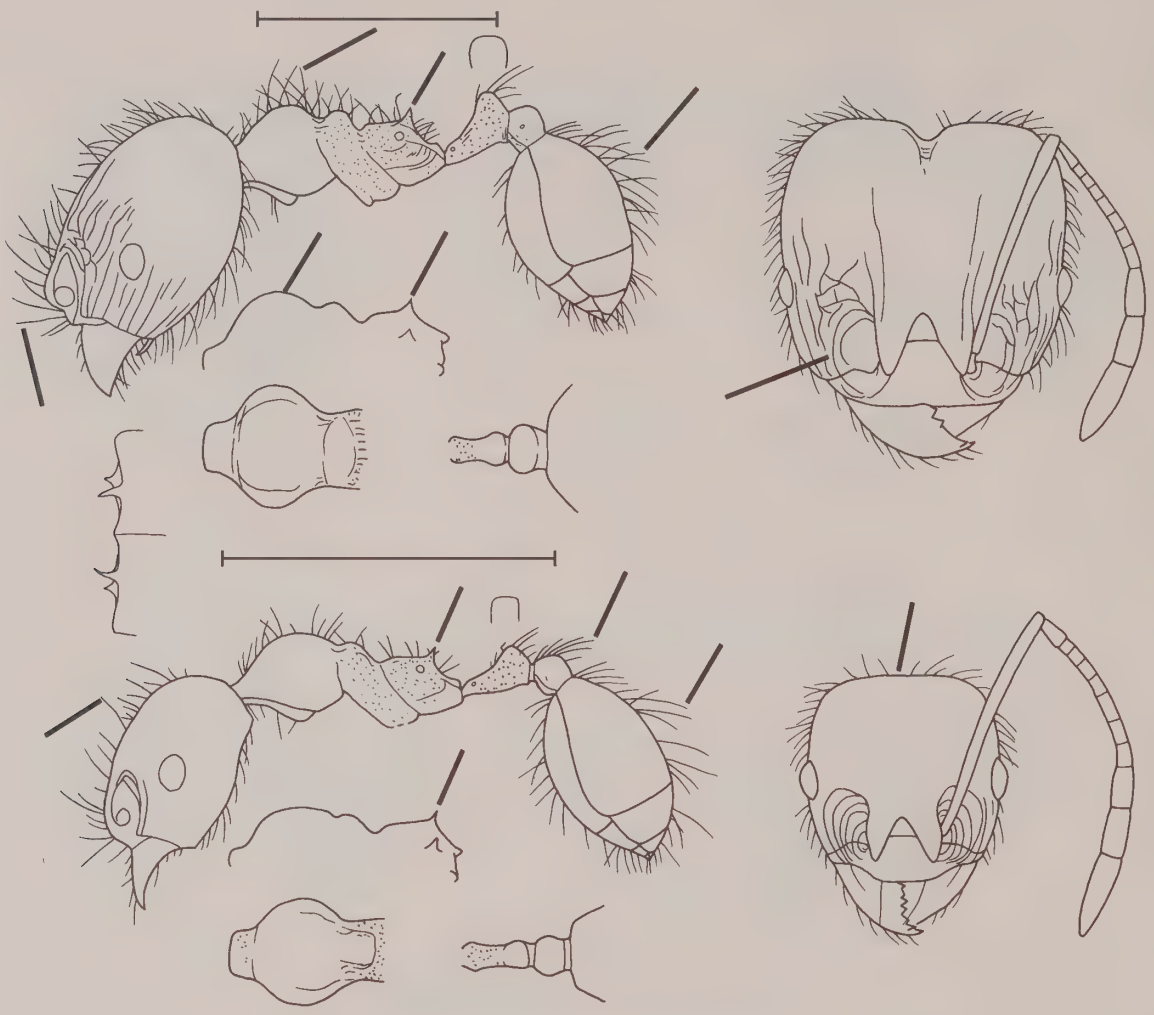
MEASUREMENTS (mm) Holotype major: HW 1.32, HL 1.42, SL 1.02, EL 0.20, PW 0.62.
Paratype minor: HW 0.60, HL 0.80, SL 1.04, EL 0.16, PW 0.40.

COLOR Major: concolorous medium reddish yellow ("orange").
Minor: concolorous brownish yellow.

RANGE Northern Pacific lowlands of Costa Rica.

BIOLOGY Longino (1997) found the species in open habitats of seasonally dry areas. Workers forage on the ground and up into low vegetation.

FIGURE Upper: holotype, major. Lower: paratype, minor. TRINIDAD: Aripo Ridge, Arima Valley, 550–650 m (Stefan Cover and Mark W. Moffett). Scale bars = 1 mm.



Pheidole midas **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *Midas,* mythical king whose touch turned everything to gold; with reference to the color of the workers.

DIAGNOSIS A small yellow member of the *fallax* group characterized by the following combination of traits.

Major: head heart-shaped; pilosity over all of body, and especially clypeus, mesosoma, waist, and gaster, very long, dense, and erect to suberect; a large-celled patch of rugoreticulum present to the side and behind each antennal fossa; carinulae on head and body almost entirely limited to the anterior half of the head, with most of the frontal lobes bare.

Minor: occiput broad, lacking nuchal collar; pilosity very long and mostly erect to suberect; only carinulae present are the circular ones around the antennal fossae, and foveolation is limited to the meso- and metathorax and propodeum, with the rest of the body smooth and shiny.

Similar to *aenescens, alienata, bergi, chrysops, cordiceps,* and *nesiota,* as described and illustrated.

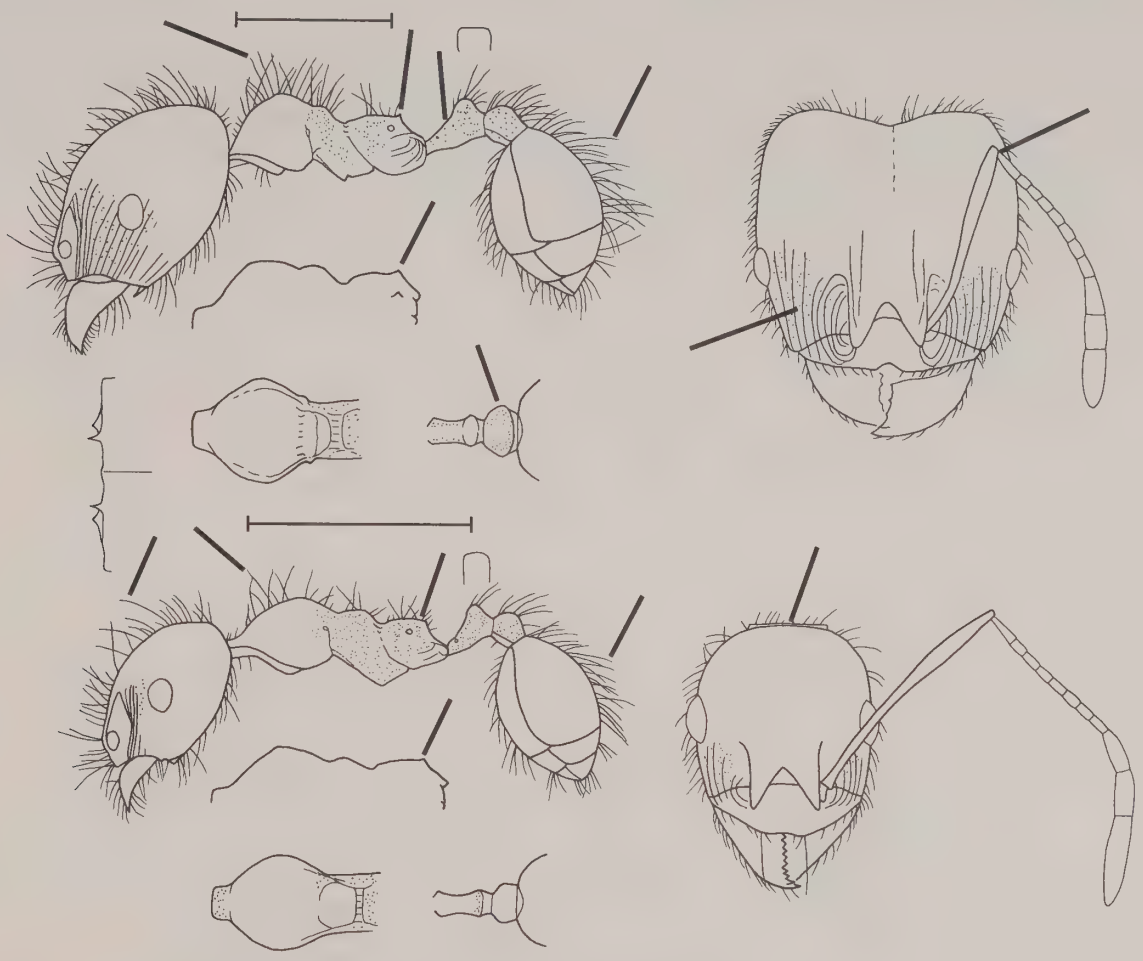
MEASUREMENTS (mm) Holotype major: HW 0.92, HL 0.88, SL 0.74, EL 0.14, PW 0.46.
Paratype minor: HW 0.50, HL 0.62, SL 0.70, EL 0.10, PW 0.34.

COLOR Major and minor: concolorous medium yellow.

RANGE Known from the type locality (Trinidad) as well as series from Panama, Colombia, Brazil (Pará), Peru, and Ecuador.

BIOLOGY Stefan Cover collected the type colony from a nest in a rotting stick on the floor of montane rainforest.

FIGURE Upper: major. Lower: minor. NEW YORK: Selden, Suffolk Co. (Type locality: Vineland, New Jersey.) Scale bars = 1 mm.



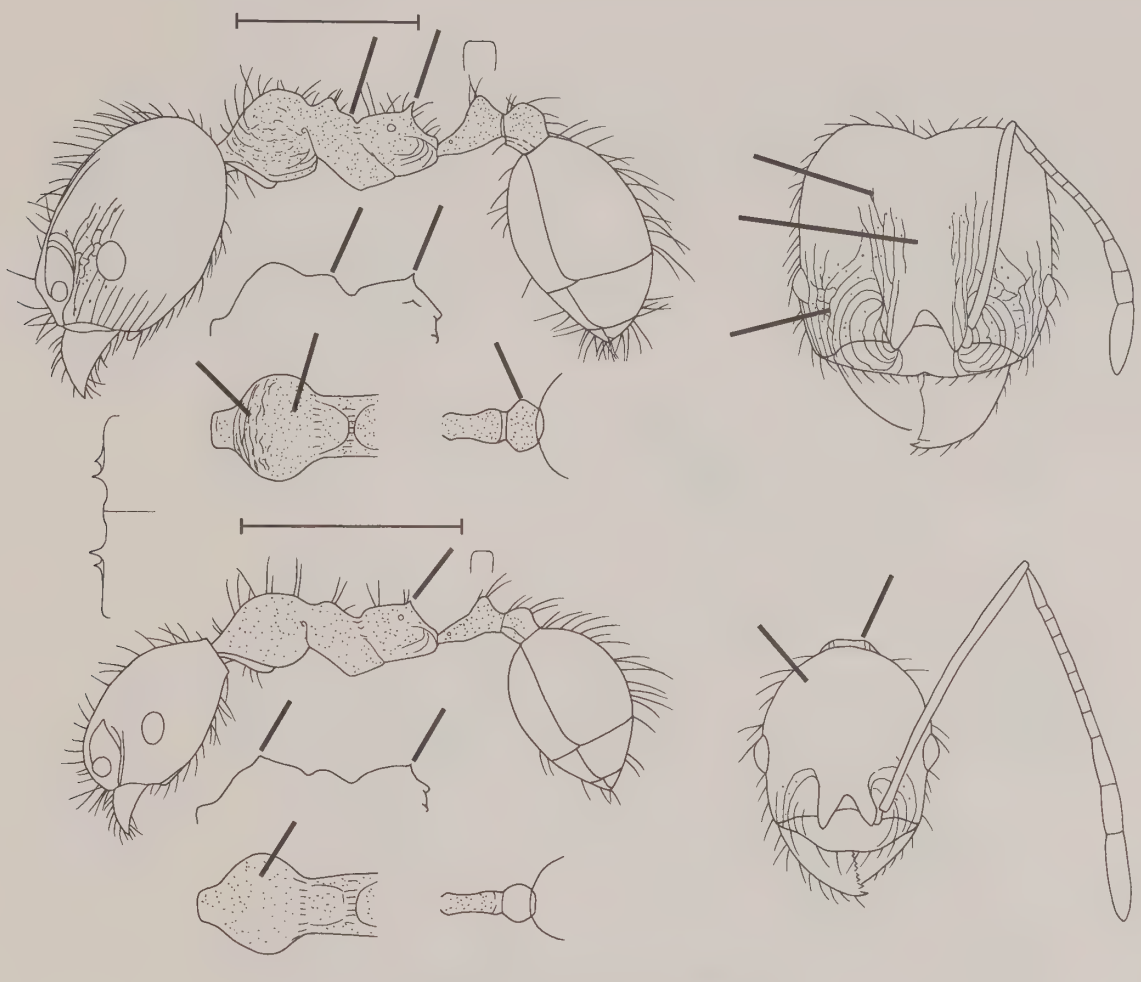
Pheidole morrisi Forel

Pheidole morrisii Forel 1886b: xlvi. Syn.: *Pheidole morrisi* var. *impexa* Wheeler 1908h: 461, n. syn.; *Pheidole morrisii* var. *vanceae* Forel 1901j: 351, synonymy by Creighton 1950a: 183.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY Eponymous.
DIAGNOSIS A member of the *fallax* group easily distinguished by the following traits.
Major: yellow; antennal scape approaches occipital corner within 2× its own width; propodeal spines reduced to denticles; rugoreticulum lacking on head; pilosity dense and very long, many hairs longer than Eye Length; postpetiole from above elliptical, with subangulate lateral borders.
Minor: yellow; propodeal spines reduced to right or obtuse angles; occiput slightly narrowed, with thin nuchal crest. The types of *impexa* differ from typical eastern *morrisi* in having two-layered gastral pilosity, flattened scape at the bend, and a more narrowly tapered petiolar node in the major. I have treated the form as a western geographic variant, i.e., from Oklahoma and Texas, but it may prove to be a distinct species.
MEASUREMENTS (mm) Major (Selden, New York): HW 1.26, HL 1.26, SL 0.88, EL 0.24, PW 0.62.
Minor (Selden, New York): HW 0.60, HL 0.82, SL 0.90, EL 0.16, PW 0.40.
COLOR Major: concolorous yellow.
Minor: yellow, with head and mesosoma a slightly darker shade than rest of body and appendages.
RANGE Long Island, New York south to South Florida, and west to Illinois, Missouri, Oklahoma, and Texas.
BIOLOGY This is a locally abundant species that prefers pure sand, where it often builds crater mounds or nests at the base of grass clumps. According to Naves (1985), colonies are large and live primarily as scavengers, although they also occasionally collect seeds.

Workers have been observed foraging as much as 8 meters or more from the nests. Minors forage singly at night, with majors often emerging from the nest to help carry back food. Nest-founding queens build vertical passageways to a claustral chamber 20–30 cm below the surface, and use the excavated soil of the chamber to plug the passageway. Naves observed rapid growth in incipient colonies: the first minors emerge in 30 days, the first majors in 50 days, with colonies growing to several hundred workers in 8 months. In New York winged queens are present in nests during July, and in Florida as early as May (Stefan Cover, unpublished records). Cover (personal communication) has also noted that *morrisi* "shows a fascinating variation in life history over its large geographic range. Populations in the northeast (Long Island and New Jersey pine barrens) have pleometrotic colony founding, and exhibit primary polygyny—one of the very few documented cases in the ants. Colonies are almost always monodomous. In the southeastern United States, *morrisi* is haplometrotic and monogynous but colonies are often polydomous."

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: Cananeia, Ilha do Cordoso-Mata (L. C. Duarte). Scale bars = 1 mm.

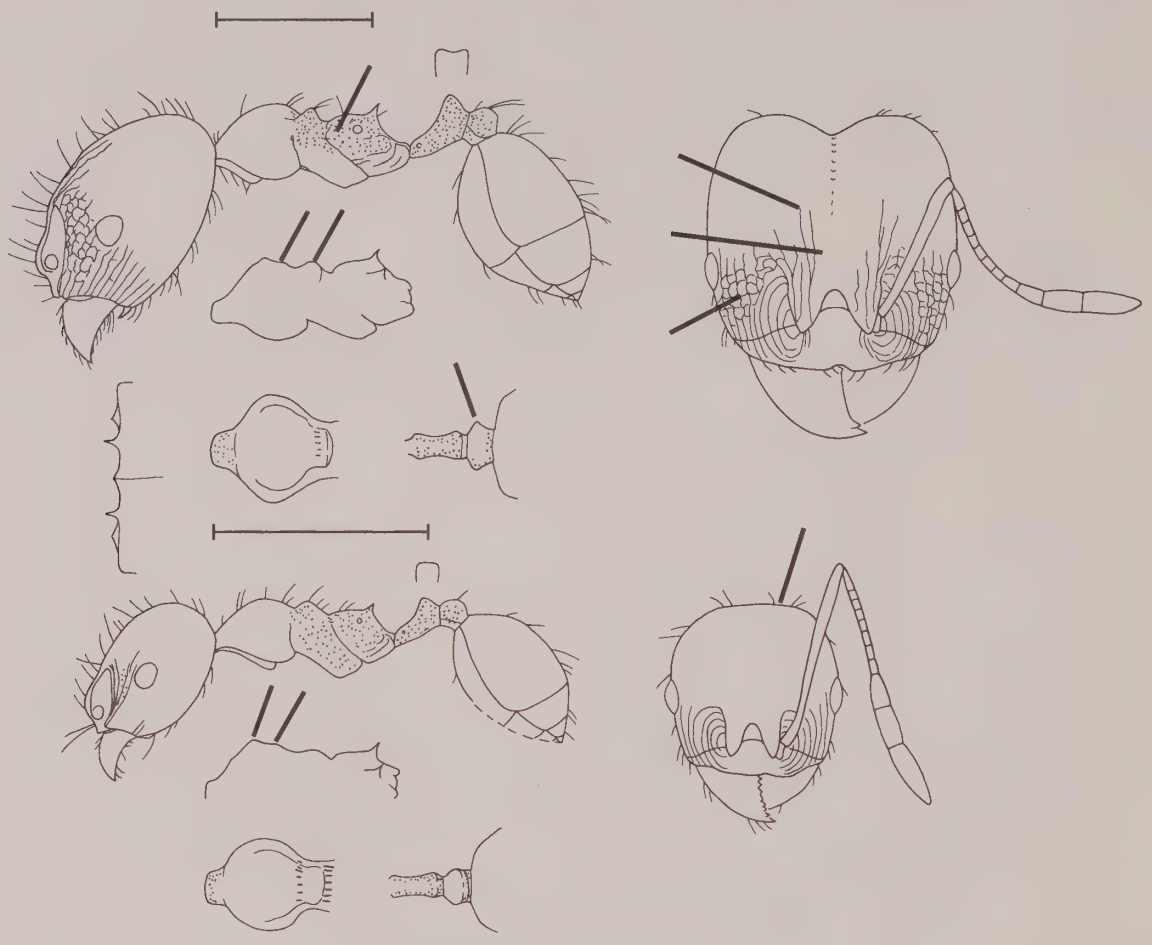


Pheidole nesiota **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *nesiota,* islander, referring to the type locality.
DIAGNOSIS A member of the *fallax* group, similar to the species listed above in the heading, distinguished as follows.
Major: antennal scape slightly exceeds occipital corner; all of promesonotum foveolate and opaque; anterior third of pronotum carinulate; rugoreticulum on head confined to area mesad to eye; mesonotal convexity in side view followed posteriorly by second, feeble convexity, which is also anterior to the metanotal depression; propodeal spines small; carinulae on frontal lobes limited to margins; postpetiole diamond-shaped.
Minor: humerus obtuse-angulate in dorsal-oblique view; propodeal spine equilaterally triangular; promesonotum entirely foveolate and opaque; occiput narrowed, with nuchal collar.
MEASUREMENTS (mm) Holotype major: HW 1.16, HL 1.16, SL 1.00, EL 0.20, PW 0.60.
Paratype minor: HW 0.50, HL 0.62, SL 0.86, EL 0.14, PW 0.34.
COLOR Major: body medium brown, appendages yellowish brown.
Minor: yellowish brown except for tarsi, which are clear yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *bergi, cordiceps, dione, eidmanni, pampana*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ARGENTINA: La Plata, Buenos Aires (C. Spegazzini). Scale bars = 1 mm.

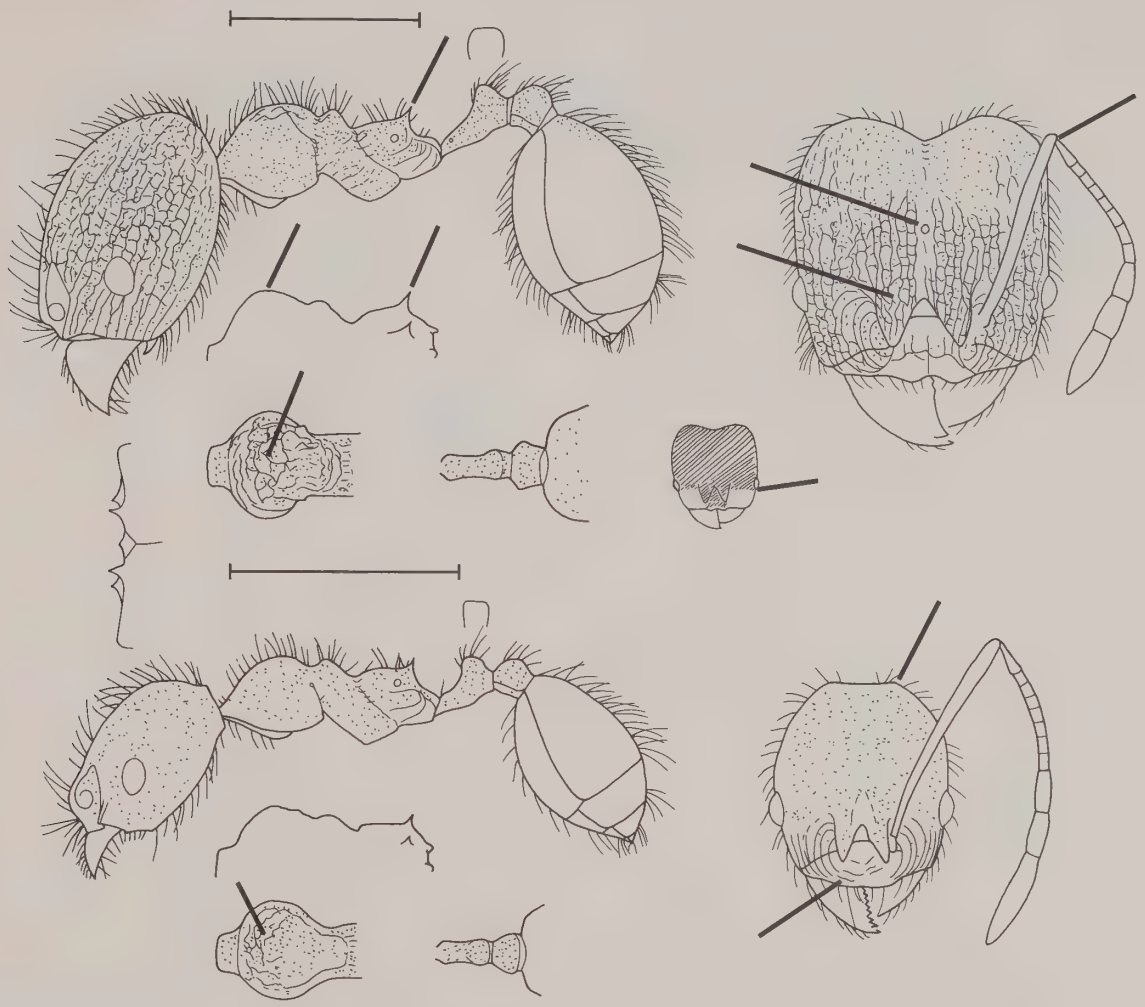


Pheidole nitidula Emery

Pheidole triconstricta var. *nitidula* Emery 1888e: 693, raised to species level by Emery 1906c: 154. Syn.: *Pheidole strobeli* Emery 1906c: 149, n. syn.; *Pheidole perversa* Forel 1908h: 373, n. syn.; *Pheidole perversa* subsp. *richteri* Forel 1909a: 266, n. syn. (provisional, types not located); *Pheidole strobeli* var. *misera* Santschi 1916e: 373, synonymy by Santschi 1929d: 282; *Pheidole strobeli* subsp. *silvicola* Borgmeier 1927b: 61, n. syn. (provisional, types not located); *Pheidole nitidula* st. *strobeli* var. *labrata* Santschi 1929d: 282, unavailable name (quadrinomial); *Pheidole nitidula* st. *strobeli* var. *vicina* Santschi 1929d: 282, unavailable name (quadrinomial); *Pheidole nitidula* var. *daguerrei* Santschi, 1931f: 275, n. syn.
Raised to species level in this monograph: *pampana*.

TYPES Mus. Civ. Stor. Nat. Genova.
ETYMOLOGY L *nitidula,* little shining one.
DIAGNOSIS A member of the *fallax* group, similar to *bergi, cordiceps, dione, eidmanni,* and *pampana* of southern South America, differing as follows.
Major: pilosity sparse; rugoreticulum on each side of head extends between eye and antennal fossa and anteriorly almost to border of head; vertex smooth; carinulae originating on frontal lobes not quite reaching midway between level of eyes and level of occiput; pronotal dorsum in dorsal-oblique view weakly bilobous; metanotal convexity in side view symmetrical; carinulae absent from sides of propodeum; postpetiole from above symmetrical.
Minor: pilosity sparse; pronotum in dorsal-oblique view feebly bilobate; occiput in frontal view feebly convex, nearly flat, lacking nuchal collar.
MEASUREMENTS (mm) Lectotype major: HW 1.30, HL 1.32, SL 0.84, EL 0.22, PW 0.66.
Paralectotype minor: HW 0.68, HL 0.74, SL 0.82, EL 0.18, PW 0.44.
COLOR Major: concolorous reddish brown.
Minor: concolorous plain medium brown.
RANGE I have verified material from Buenos Aires, Córdova, Misiones, and Salta in Argentina, and Rio Grande do Sul in Brazil. Kempf (1972b) also reports it from Rio de Janeiro.
BIOLOGY Unrecorded.

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: Rancho del Cielo, Sierra de Guatemala, Tamaulipas, 1070 m (Cornell University Expedition group, 1965). Scale bars = 1 mm.



Pheidole nubicola **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *nubicola,* cloud-dweller, referring to the mountain habitat of the type colony.

DIAGNOSIS A member of the *fallax* group similar to *cielana* of Mexico and *inca* of Peru, distinguished as follows.

Major: frontal lobes, sides of head, most of vertex, and pronotal dorsum rugoreticulate; median ocellus present; antennal scape attains occipital border; head bicolored (see Color below).

Minor: all of head, mesosoma, and waist foveolate and opaque; pronotal dorsum rugoreticulate; midclypeus with scattered short rugulae; occiput strongly constricted but lacks nuchal collar.

MEASUREMENTS (mm) Holotype major: HW 1.18, HL 1.20, SL 0.96, EL 0.20, PW 0.62.
Paratype minor: HW 0.64, HL 0.74, SL 0.94, EL 0.16, PW 0.42.

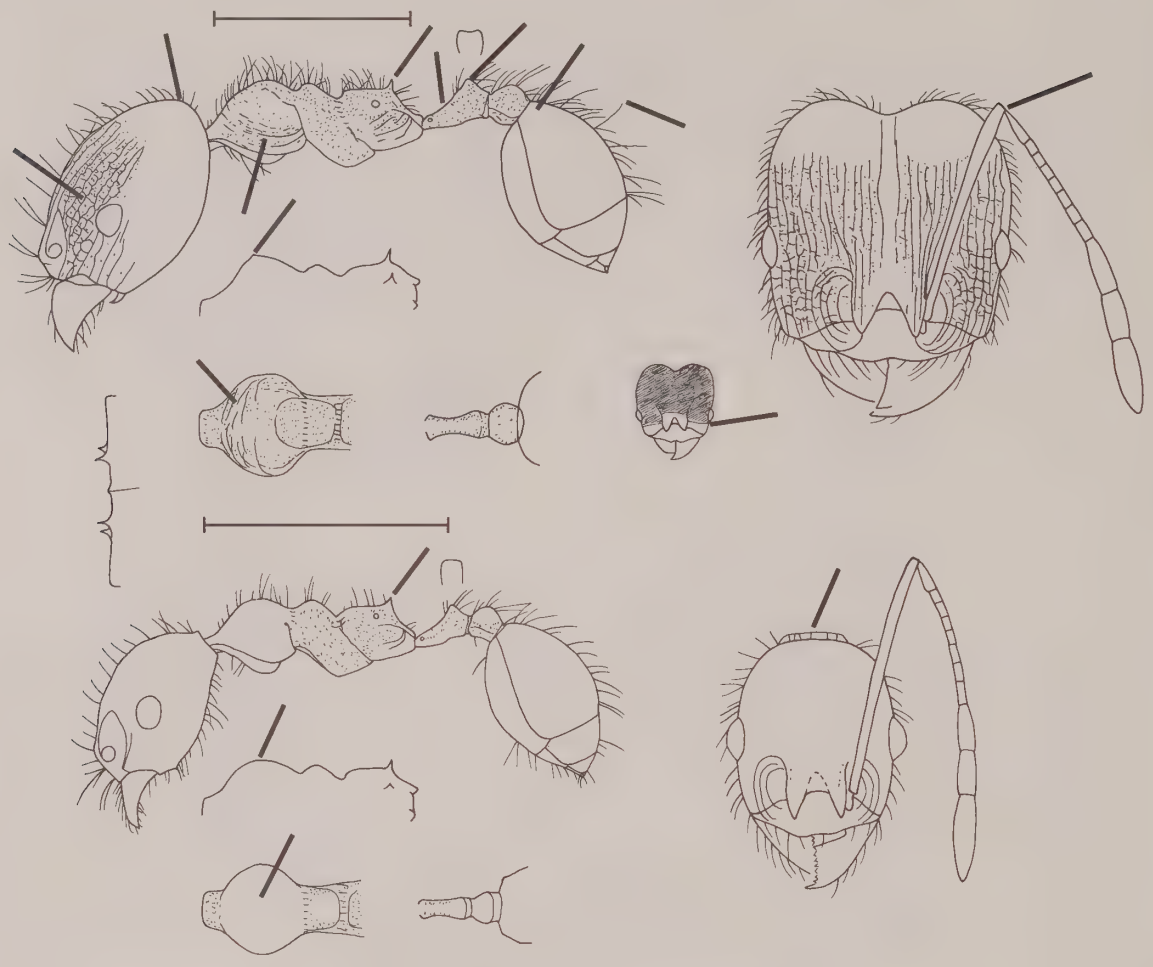
COLOR Major: body medium brown; head bicolored, with anterior fourth dark yellow (except for clypeus and frontal triangle, which are medium brown); appendages dark yellow.

RANGE Known from the type locality, and from the La Perla-Rancho Somecla road on Mt. Orizaba, Veracruz, 1800–2000 m (E. O. Wilson).

BIOLOGY This species occurs in transitional tropical-temperate cloud forest. One colony collected at Rancho Cielo by P. S. Ward was in a rotten log. Another I found on Mt. Orizaba was under a large rock in hardwood forest dominated by *Liquidambar* and *Carpinus,* with a *Cyathea*-melastome understory. Winged queens were present in a nest at Rancho Cielo on 23 July.

Compare with *caribbaea, haskinsorum, lattkei, petrensis, susannae*

FIGURE Upper: major. Lower: minor. BRAZIL: Caraguatatuba Reserva Floresta, São Paulo, 40–80 m (William L. Brown). Major and minor compared with lectotype and paralectotype by E. O. Wilson. (Type locality: Guanabara, Rio de Janeiro, Brazil.) Scale bars = 1 mm.

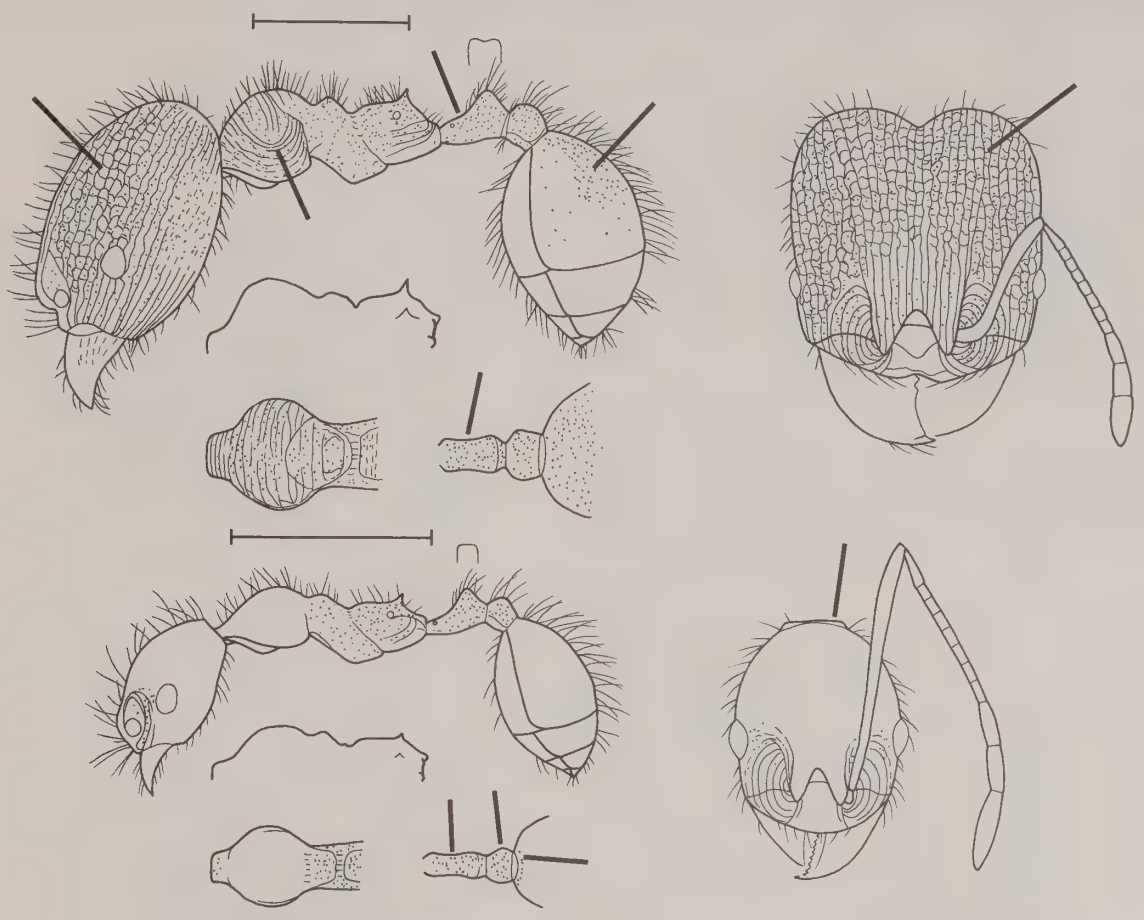


Pheidole obscurior Forel, **new status**

Pheidole susannae r. *obscurior* Forel 1886b: xliv. Syn.: *Pheidole partita* Mayr 1887: 590, n. syn.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY L *obscurior,* darker, presumably in comparison to the yellow *susannae.*
DIAGNOSIS A member of the *fallax* group, closest to *susannae* but also resembling *haskinsorum, lattkei,* and *petrensis,* and distinguished as follows.
Major: color mostly light to medium brown; head sometimes bicolorous, as illustrated, and described below; antennal scape reaching slightly beyond occipital corner; rugoreticulum extensive around eye but not laterad to it; humerus subangulate in dorsal-oblique view; pronotum carinulate; mesosoma and waist entirely foveolate and opaque, but first gastral tergite entirely smooth and shiny; petiolar node in side view tapering to a blunt point.
Minor: occiput moderately narrowed, with nuchal collar.
MEASUREMENTS (mm) Lectotype major: HW 1.32, HL 1.44, SL 1.04, EL 0.20, PW 0.64.
Paralectotype minor: HW 0.60, HL 0.80, SL 1.02, EL 0.16, PW 0.44.
COLOR Major: light to medium reddish brown, with reddish tinge very slight.
Minor: concolorous brownish yellow.
RANGE Reported by Kempf (1972b) from Santa Fé and Misiones, Argentina; southeastern Brazil; Colombia; Trinidad; St. Vincent; Costa Rica; and Guatemala. I have been able to verify series from Rio de Janeiro, São Paulo, and Meta, Colombia.
BIOLOGY Colonies collected by H. H. Smith on St. Vincent and identified by Forel (1893j) as *obscurior* were in logs and other pieces of rotten wood in or near forests. They were populous, containing 500–1000 individuals, and aggressive when disturbed. The species was considered by Smith to be rare. He found winged queens and males in nests in early November.

FIGURE Upper: lectotype, major. Lower: paralectotype minor. ARGENTINA: Alta Gracia, Córdoba. Scale bars = 1 mm.



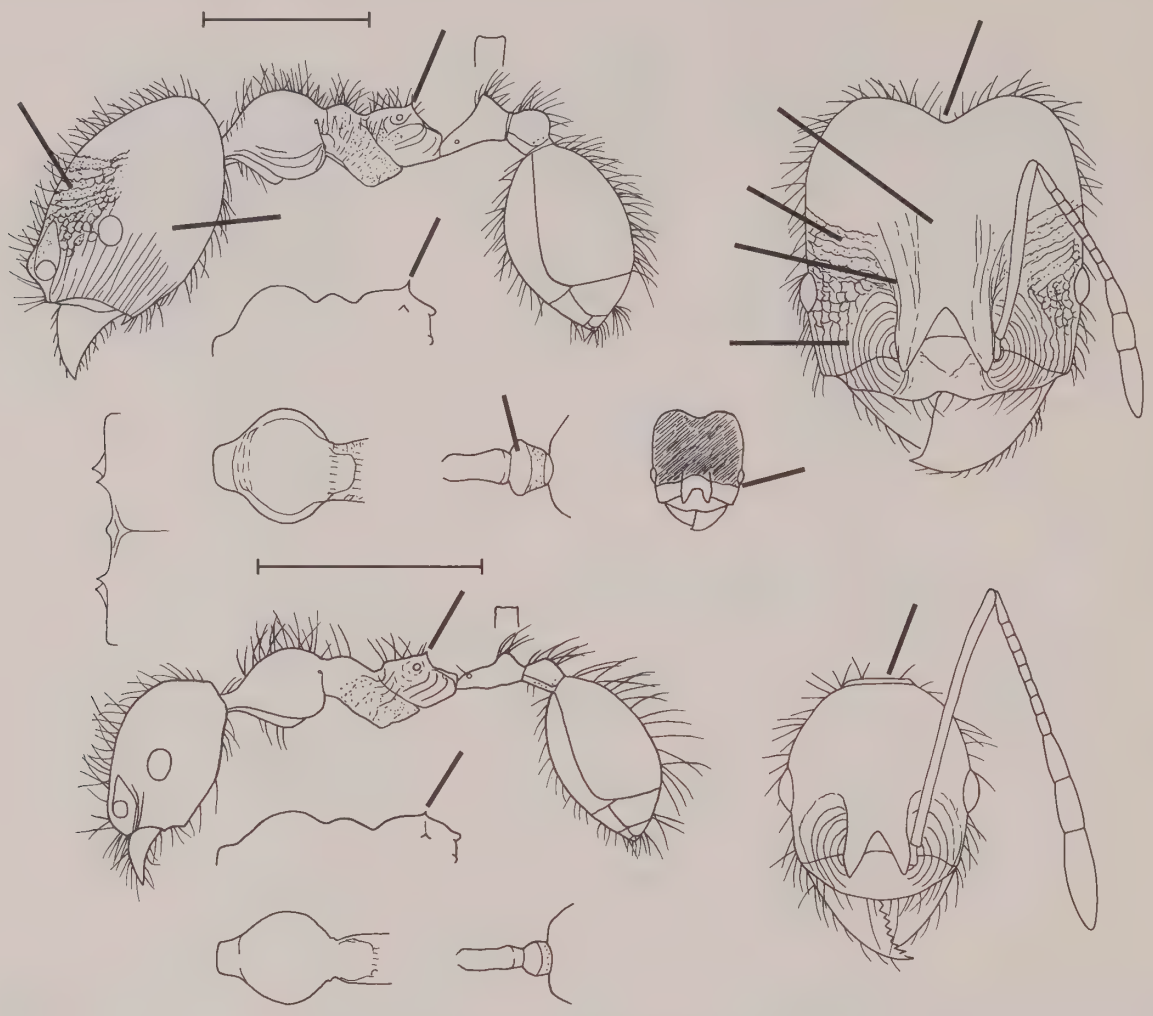
Pheidole obscurithorax Naves, **new status**

Pheidole fallax obscurithorax Naves 1985: 61; first valid use of name for *Pheidole obscurithorax* st. *arenicola* var. *obscurithorax* Santschi 1923d: 58, unavailable name (quadrinomial).

TYPES Naturhist. Mus. Basel.
ETYMOLOGY L *obscurithorax,* dark thorax.
DIAGNOSIS A member of the *fallax* group close to the species listed in the heading, distinguished as follows.
Major: large (Head Width 1.70–1.80 mm); medium to dark reddish brown; robust; with relatively short scapes (Scape Length/Head Width 0.50–0.59 mm); posterior half of head heavily rugoreticulate; anterior half of first gastral tergite heavily shagreened and opaque; petiolar node thick from the side and from above, as illustrated.
Minor: dorsa of petiolar and postpetiolar nodes foveolate and opaque; anterior fringe of median strip of first gastral tergite shagreened.
MEASUREMENTS (mm) Lectotype major: HW 1.70, HL 1.84, SL 0.98, EL 0.24, PW 0.86.
Paralectotype minor: HW 0.62, HL 0.80, SL 0.94, EL 0.18, PW 0.48.
COLOR Major: head light reddish brown; mesosoma, waist, and appendages medium reddish brown; gaster dark reddish brown. Minor: body medium reddish brown to plain dark brown; appendages light reddish to yellowish or light plain brown.
RANGE Kempf (1972b) reports *obscurithorax* from Córdoba, Formosa, and Santa Fé in northern Argentina. I have also seen series from the Parana River and Canindeyú Province in Paraguay. In 1950 I discovered a colony nesting in Mobile, Alabama, within a kilometer of the ship docking area, an ideal entry point for exotic species, such as *obscurithorax,* that occur in or near potential embarkation areas along or close to the banks of the Paraguay and La Plata Rivers of southwestern Brazil, Paraguay and Brazil. Shipping has occurred regularly over decades between these areas and the ports of the southern United States. *P. obscurithorax* has since been found in Baldwin County, Alabama, across the bay from Mobile, and in adjacent, westernmost Florida (Naves 1985). Walter Tschinkel (personal communication) reports its appearance around Tallahassee, Florida, in the late 1990s.
BIOLOGY The Mobile, Alabama, colony mentioned above occupied a large crater nest in open, sandy soil. Stefan Cover, Lloyd Davis Jr., and Mark Deyrup (Cover, personal communication), found the species in western Florida mostly in disturbed areas, but once in secondary forest in a creek valley. On several instances the nests were located close to those of the imported fire ant, *Solenopsis invicta,* suggesting superior resistance to this formidable invasive.

Compare with *galba* and *huacana*

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Bogotá-Villavicencio Highway, Km 79, Cundinamarca (W. L. Brown and I. de Polonia). Scale bars = 1 mm.



Pheidole oliveirai **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after Paulo S. Oliveira, distinguished Brazilian myrmecologist and ecologist.

DIAGNOSIS A member of the *fallax* group, similar to *galba* and *huacana,* differing as follows.

Major: brown; rugoreticulum on head limited to space between eye and antennal fossa on each side, preceded anteriorly by longitudinal carinulae and posteriorly by rugulae that travel from the frontal lobes to the side of the head; rear half of ventral side of head smooth; nadir of occipital concavity moderate; propodeal spines reduced to denticles; vertex smooth.

Minor: propodeal spines reduced to denticles; occiput narrow, with nuchal collar.

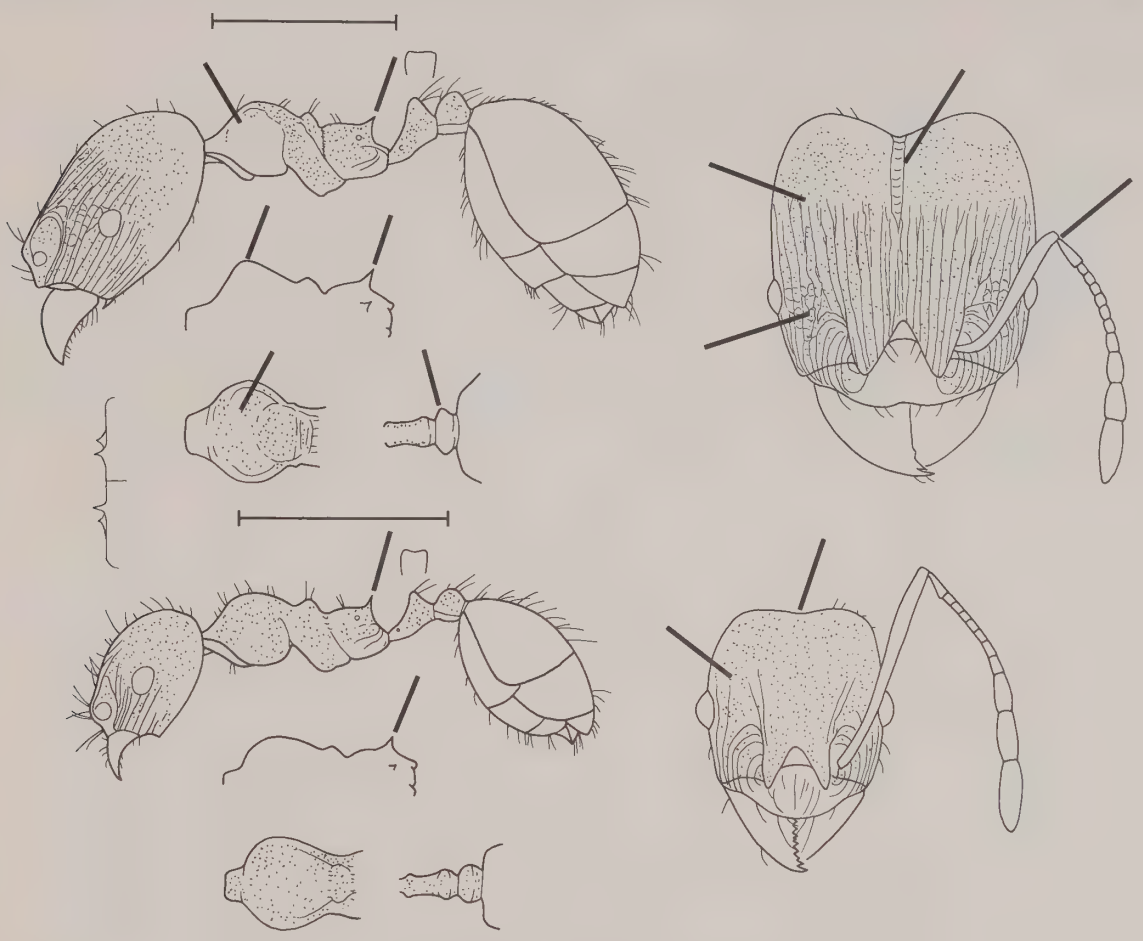
MEASUREMENTS (mm) Holotype major: HW 1.38, HL 1.54, SL 0.94, EL 0.22, PW 0.66.
Paratype minor: HW 0.60, HL 0.74, SL 0.86, EL 0.14, PW 0.40.

COLOR Major: body light brown except for anterior fourth of head capsule, which is brownish yellow, and gaster, which is dark brown.
Minor: body light brown, appendages light brown, tending toward yellowish brown.

RANGE Known from the type locality; and from near Villavicencio, Meta; and from Mocoa, Putumayo, 610 m (Charles Kugler). The record of *P. oliveirai* recorded by Fernandes et al. (1994) from San Antonio de Posse, São Paulo, is in error, due to my own misidentification. The species they studied is actually *P. oxyops,* a member of the *diligens* group (q.v.).

BIOLOGY The Cundinamarca and Meta series were collected from steep forested slopes.

FIGURE Upper: syntype, major. Lower: syntype, minor. MEXICO: Cuernavaca, Morelos (William M. Wheeler). Scale bars = 1 mm.



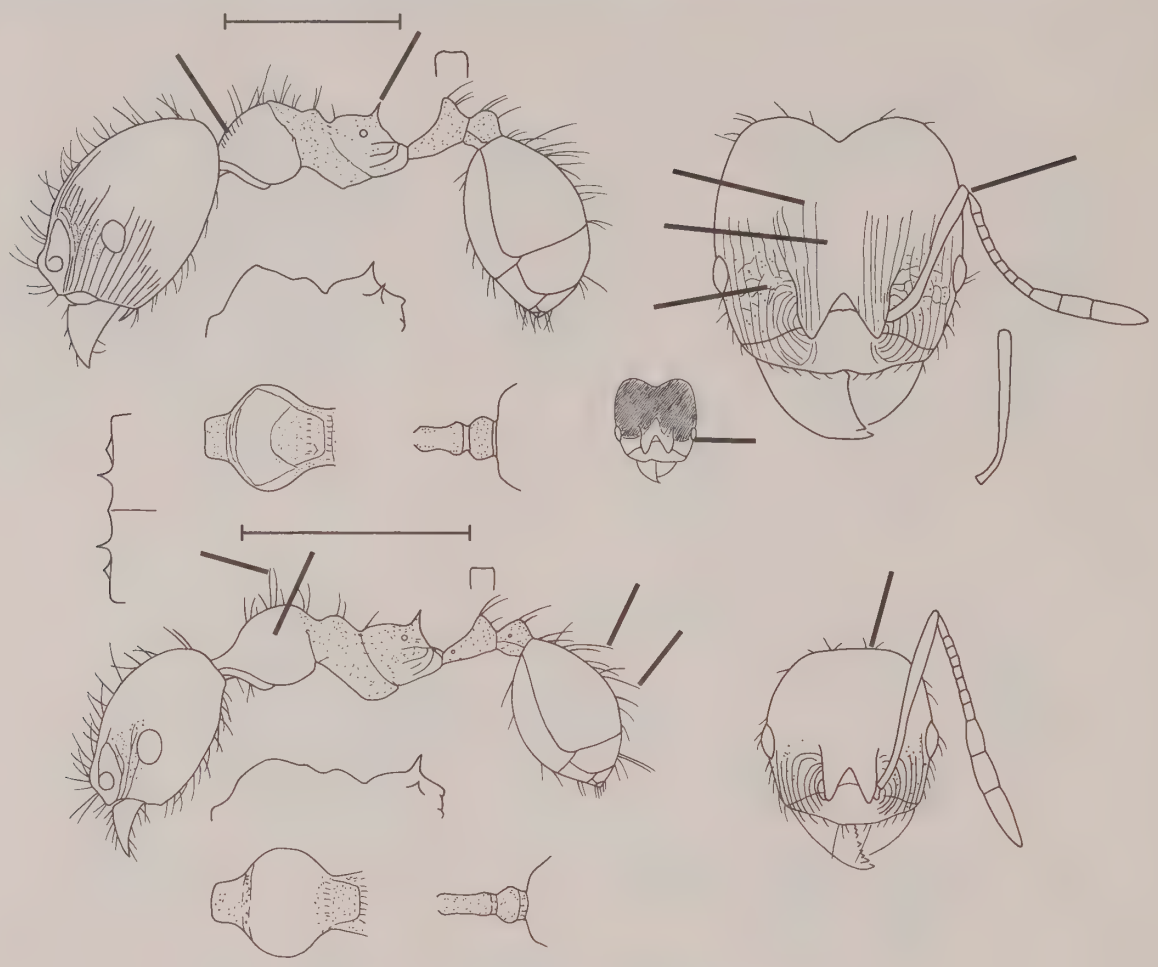
Pheidole optiva Forel

Pheidole optiva Forel 1901d: 132.

TYPES Mus. Hist. Nat. Genève; Mus. Comp. Zool. Harvard.
ETYMOLOGY Unknown.
DIAGNOSIS A member of the *fallax* group, sharing some traits with *sciara* but differing from it and other group members as follows.
Major: antennal scapes reaching a little less than midway between eyes and occipital corners; carinulae of dorsal head surface also reaching halfway between eye and occipital corners; dorsal head surface foveolate except for frontal triangle, mid-clypeus, and occipital border, which are smooth and shiny; pronotal dorsum and rest of mesosoma foveolate, lacking carinulae; pronotum in dorsal-oblique view a single convexity peaked at humerus; propodeal spines directed posteriorly; postpetiole elliptical from above; pilosity sparse to moderate over body, and on the first gastral tergite consisting substantially of short subrecumbent hairs.
Minor: eyes medium in size, with Eye Length one-fifth Head Width; all of head, mesosoma, and waist foveolate and opaque to feebly shiny; occiput broad and concave in frontal view.
MEASUREMENTS (mm) Syntype major: HW 1.12, HL 1.20, SL 0.64, EL 0.14, PW 0.60.
Syntype minor: HW 0.60, HL 0.70, SL 0.68, EL 0.12, PW 0.42.
COLOR Major: body light reddish brown except for gaster, which is medium reddish brown.
Minor: body medium reddish yellow except for gaster, which is dark reddish yellow.
RANGE Known only from the type locality.
BIOLOGY Wheeler (1901h) took the type series, which he transmitted to Forel, from large colonies nesting beneath tree-shaded stones in a ravine at Cuernavaca. Both the majors and minors were "remarkably slow" in their movements.

Compare with *bergi, cordiceps, eidmanni, nitidula*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ARGENTINA: Alta Gracia, Córdoba. Scale bars = 1 mm.

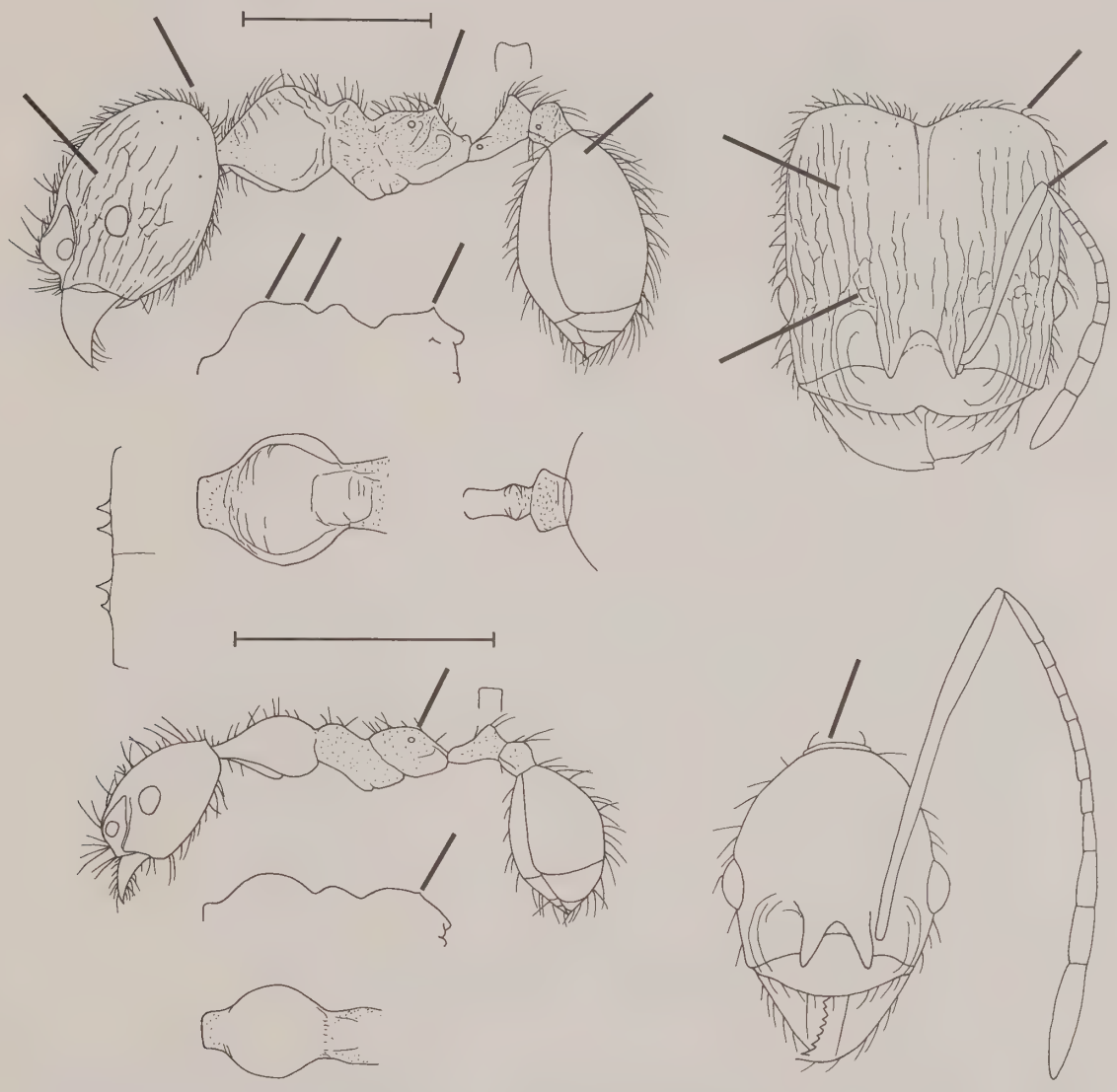


Pheidole pampana Santschi, **new status**

Pheidole nitudula st. *pampana* Santschi 1929d: 383. Syn.: *Pheidole nitidula* st. *pampana* var. *nigrior* Santschi 1933f: 108, not available (quadrinomial).

TYPES Naturhist. Mus. Basel.
ETYMOLOGY Referring to the pampas, the Argentine grasslands where presumably the types were collected.
DIAGNOSIS A member of the *fallax* group, similar in various characters to *bergi, cordiceps, eidmanni,* and *nitidula,* distinguished as follows.
Major: head slightly bicolorous (see Color below); humerus in dorsal-oblique view subangulate; rugoreticulum of head covering a swath between each eye and antennal fossa; carinulae absent from center of vertex, and those to each side reach less than half the distance from eye level to level of occiput; anterior strip of pronotal dorsum carinulate.
Minor: pilosity very long, with some hairs longer than Eye Length; pronotum entirely smooth; occiput narrowed, with convex border, but lacking nuchal collar.
MEASUREMENTS (mm) Lectotype major: HW 1.40, HL 1.40, SL 0.86, EL 0.22, PW 0.70.
Paralectotype minor: HW 0.72, HL 0.76, SL 0.82, EL 0.20, PW 0.46.
COLOR Major: body concolorous medium reddish brown except for anterior vertex and anterior one-third of head, which is brownish yellow; appendages yellow.
Minor: body plain medium brown, with venter and genae tending to yellowish brown; appendages brownish yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: Utinga Tract, near Belém, Pará (P. F. Darlington). Scale bars = 1 mm.

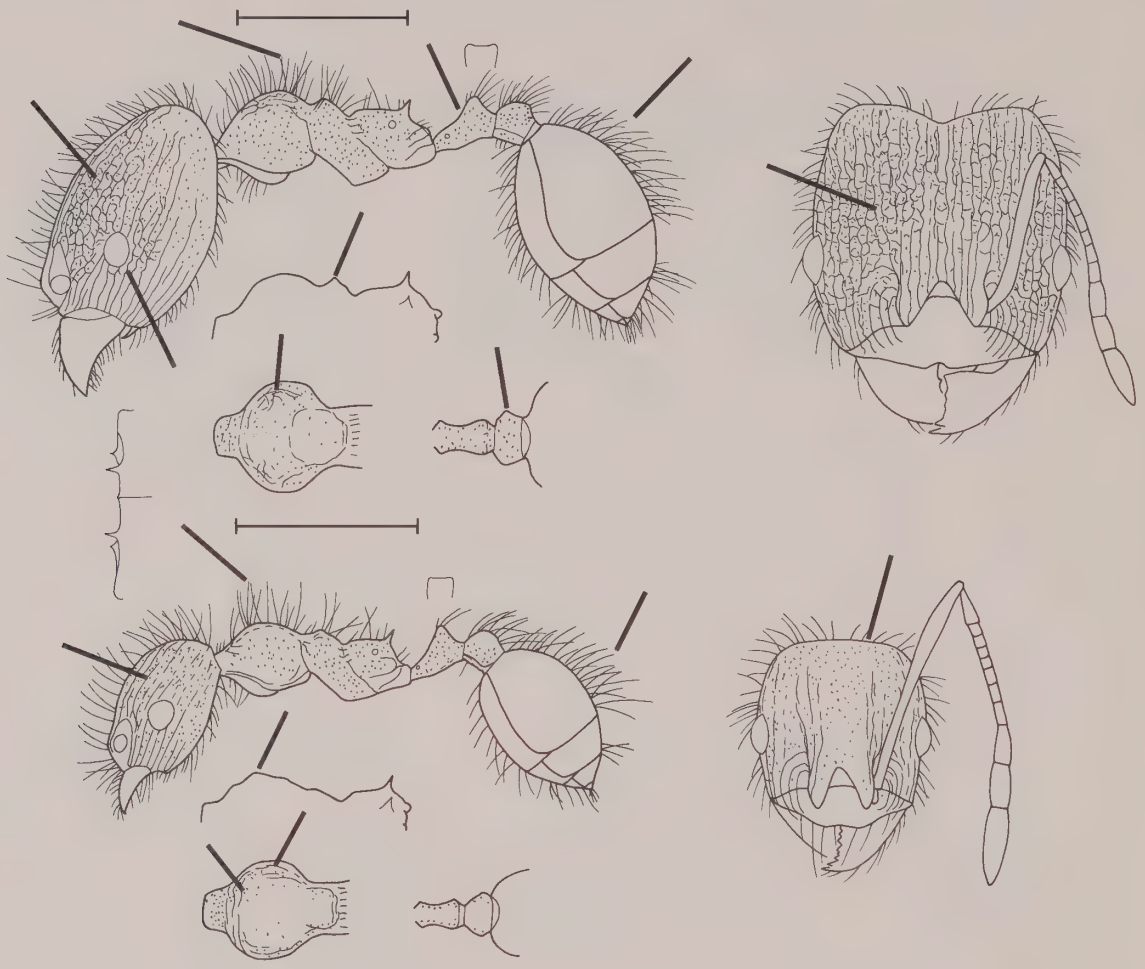


Pheidole paraensis **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the Brazilian state of origin of the types.
DIAGNOSIS A member of the "*jujuyensis* complex" of the larger *fallax* group, comprising *araneoides, cuevasi, durionei, jujuyensis, kugleri, leonina, leptina, lucretii, lupus, paraensis, punctithorax, tijucana, wallacei,* and *wolfringi*. *P. paraensis* differs as follows.
Major: proportionately small-headed; head subrectangular in full-face view; a very loose (large-celled) rugoreticulum stretches on each side of the head from eye to frontal carina and is succeeded posteriorly by widely spaced rugulae that almost attain the occiput; antennal scape reaches about halfway between level of the eye and level of occiput; propodeal spines in side view reduced to right angles.
Minor: propodeal spines absent; occiput narrowed, with thin nuchal collar.
MEASUREMENTS (mm) Holotype major: HW 1.50, HL 1.50, SL 1.00, EL 0.22, PW 0.68.
Paratype minor: HW 0.46, HL 0.64, SL 0.86, EL 0.14, PW 0.34.
COLOR Major: body and mandibles light reddish brown, gaster plain light brown, appendages brownish yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *cockerelli, gula*

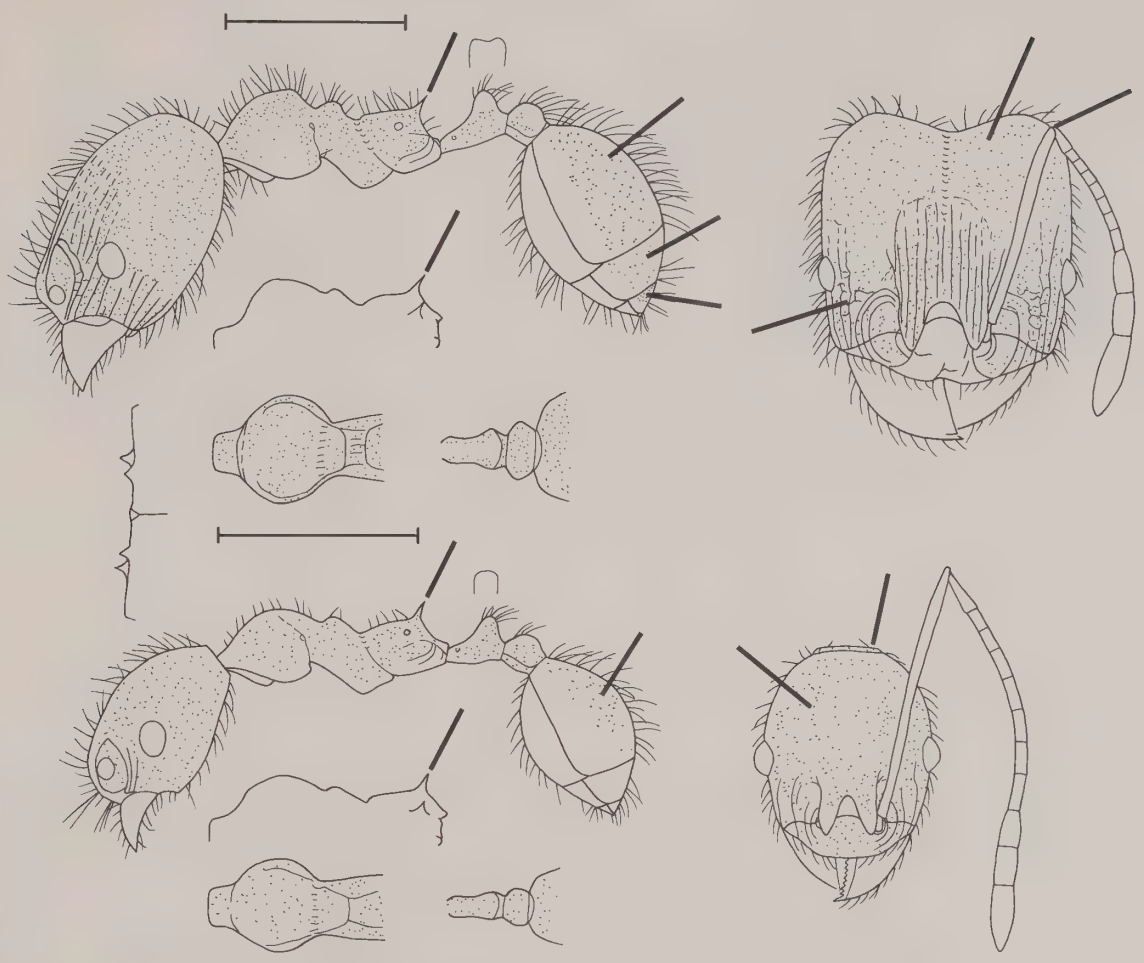
FIGURE Upper: holotype, major. Lower: paratype, minor. ARIZONA: Pinal Mt., Gila Co., 1600 m (Stefan Cover). Scale bars = 1 mm.



Pheidole perpilosa **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *perpilosa,* very hairy.
DIAGNOSIS A member of the *fallax* group similar to *cockerelli* and *gula* in some characters, distinguished as follows.
Major: yellow; densely covered by long erect to suberect hairs (many as long as Eye Length); rugoreticulum covers most of space between each eye and antennal fossa, area behind (ventral to) eye, and a broad, continuous band across the dorsal surface of the head posterior to the eyes; frontal lobes and dorsal surface of occiput carinulate; all of head, mesosoma, and waist foveolate and opaque; mesonotal convexity subangulate in dorsal-oblique view; apex of petiolar node tapered in side view; postpetiole from above diamond-shaped.
Minor: entire body densely covered by erect to suberect hairs, many longer than Eye Length; entire head and most of mesosoma foveolate and opaque; most of dorsal surface of head carinulate; anterior margin of pronotum rugulose; occipital margin in frontal view broad, lacking nuchal collar.
MEASUREMENTS (mm) Holotype major: HW 1.34, HL 1.40, SL 0.80, EL 0.22, PW 0.70.
Paratype minor: HW 0.70, HL 0.82, SL 0.92, EL 0.16, PW 0.52.
COLOR Major: body yellowish brown except for gaster, which is light brown.
Minor: body plain medium brown except for genae, which are brownish yellow; appendages brownish yellow.
RANGE Stefan Cover has collected several colonies at 1400–1850 m in the mountains of central and southern Arizona south of the Mogollon rim, in particular Cochise, Gila, and Yavapai Counties. He reports a colony intermediate between *perpilosa* and *vallicola* from Rucker Canyon, Cochise Co.
BIOLOGY Cover found colonies nesting in forests containing various combinations of pine, oak, and juniper, often in valleys, nesting under rocks or in open soil. Colonies are monogynous and large, containing up to 1500 minors and majors. The workers are predaceous; seed caches have not been found in the nests.

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: 24 km west of Cuernavaca, Morelos, 2200 m (William P. MacKay). Scale bars = 1 mm.

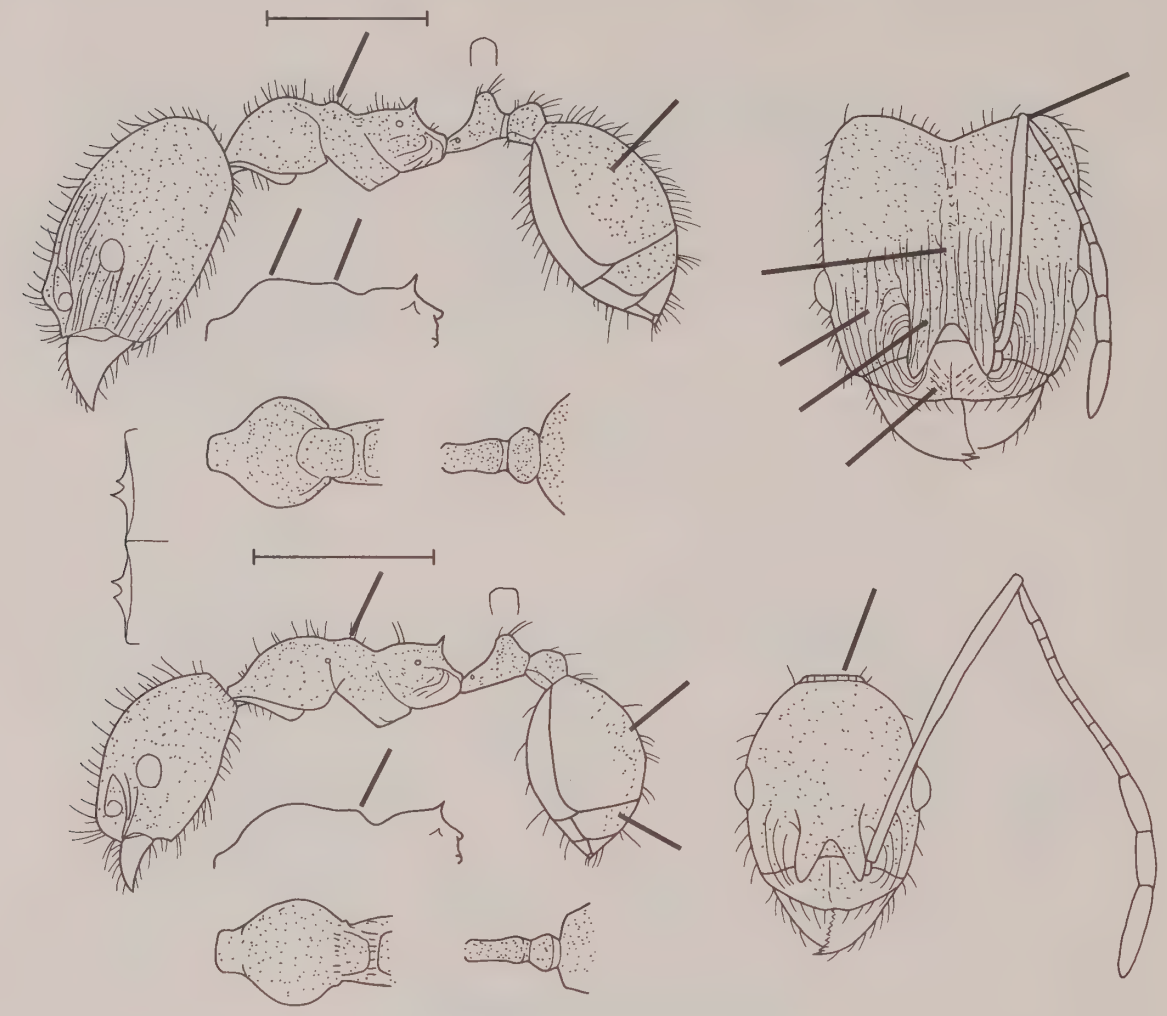


Pheidole petrensis **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr L *petrensis,* at a stone, alluding to the microhabitat of the type colony.
DIAGNOSIS A member of the *fallax* group similar to *haskinsorum, hector, lattkei,* and *susannae,* distinguished as follows.
Major: head subrectangular in full-face view; tip of antennal scape just reaches occipital corner; almost entire head, mesosoma, and waist foveolate and opaque; entire central strip of all the gastral tergites shagreened and opaque; rugoreticulum limited to space between eye and antennal fossa; carinulae limited mostly to anterior half of head, absent from rest of body; propodeal spines moderately long and thin.
Minor: propodeal spines long, very thin, needle-like; head capsule in full-face view forms almost perfect oval; nuchal collar present; entire head and body foveolate and opaque; entire central strip of first gastral tergite shagreened and opaque to subopaque.
MEASUREMENTS (mm) Holotype major: HW 1.16, HL 1.26, SL 1.02, EL 0.22, PW 0.62.
Paratype minor: HW 0.68, HL 0.84, SL 1.06, EL 0.20, PW 0.46.
COLOR Major: body and appendages medium to dark brown; a darker brown circular spot is present on vertex.
Minor: body concolorous light brown.
RANGE Known only from the type locality.
BIOLOGY Collected from beneath a rock. A male was present in the nest on 26 May.

Compare with *ariel, desertorum, hyatti, sitiens, skwarrae, vistana*

FIGURE Upper: holotype, major. Lower: paratype, minor. ARIZONA: Southwest Research Station (American Museum of Natural History), 8 km west of Portal, Cochise Co., 1650 m (William L. Brown). Scale bars = 1 mm.



Pheidole portalensis **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Referring to the type locality.

DIAGNOSIS A member of the *fallax* group, similar to the species listed in the heading above, and distinguished as follows.

Major: no rugoreticulum on head or anywhere else on body; antennal scapes just attain the occipital border; entire head, mesosoma, and waist foveolate and opaque; almost all of first two gastral tergites shagreened and opaque; carinulae around midline of head dorsum attain occiput; midclypeus faintly carinulate; mesonotal convexity very low.

Minor: entire head, mesosoma, and waist foveolate and opaque; entire median strip of first two gastral tergites shagreened; mesonotal convexity very low; occiput narrowed, with nuchal collar.

MEASUREMENTS (mm) Holotype major: HW 1.40, HL 1.50, SL 1.30, EL 0.24, PW 0.66.
Paratype minor: HW 0.74, HL 0.96, SL 1.28, EL 0.20, PW 0.50.

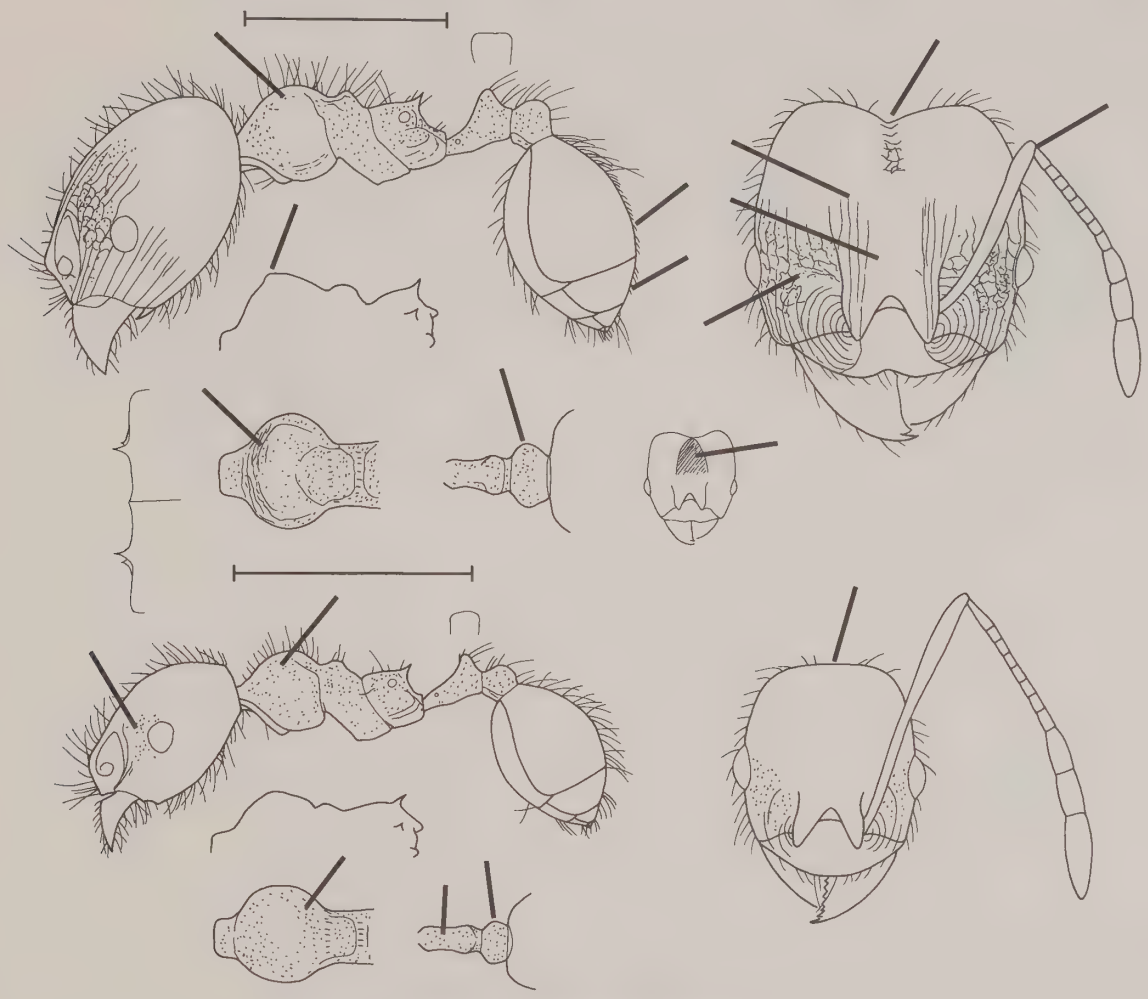
COLOR Major: body and appendages light reddish brown except for gaster, which is plain medium brown.
Minor: body light reddish brown except for gaster, which is plain medium brown; appendages reddish yellow.

RANGE Known from the mountains of southern Arizona, from the Santa Catalinas in the north to the Pajaritos in the west and east to the type locality.

BIOLOGY Stefan Cover reports (personal communication) that "*portalensis* is an inhabitant of rock walls, where it nests in cracks, in elevations from 1100 to 1800 m. Colonies consist of several hundred ants or more. Minors forage singly on the rock faces, and recruit regularly to good food sources. Baiting is the only reliable way to locate colonies."

Compare with *psilogaster* especially, also with *acamata, cielana, cockerelli, dione, hyatti, midas*

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: 3 km northeast of Xilitia, San Luis Potosi (A. B. Hamton and B. S. Ikeda). Scale bars = 1 mm.

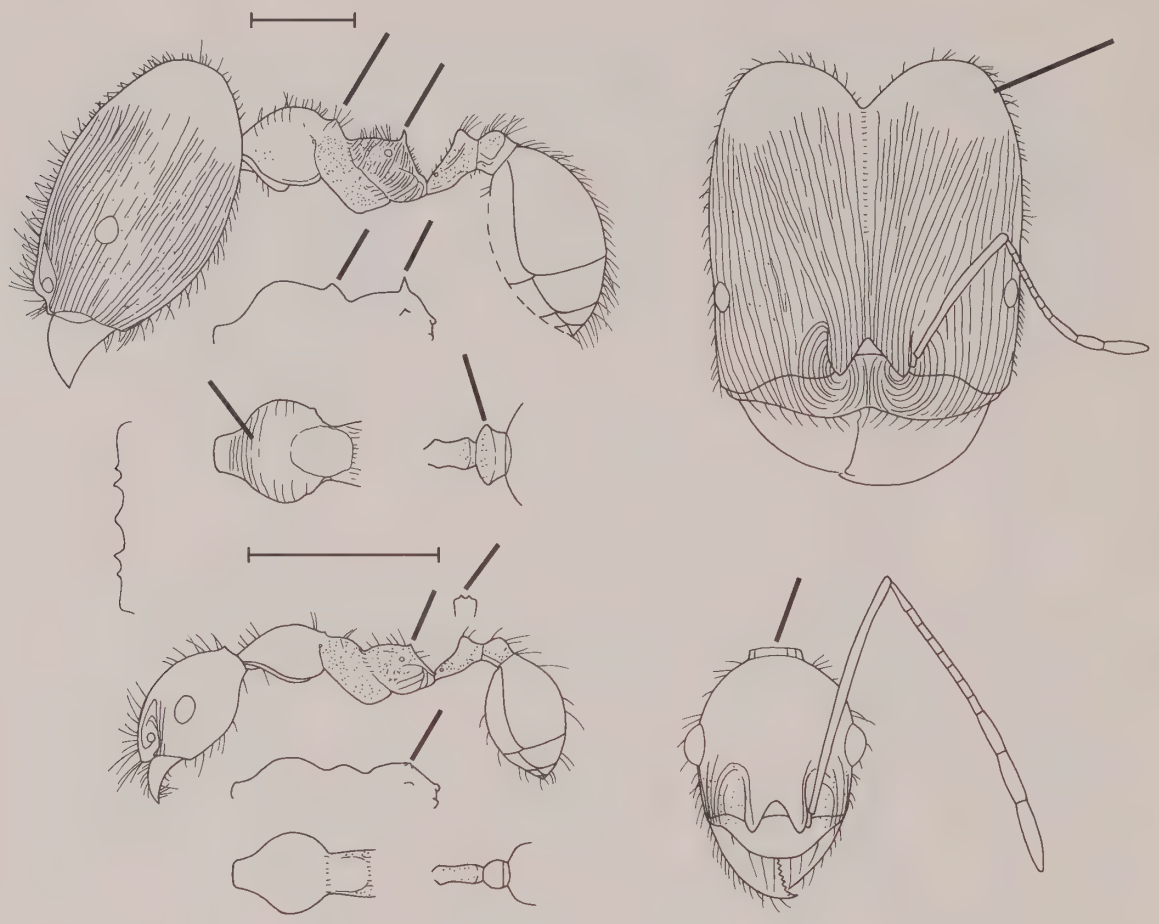


Pheidole potosiana **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the Mexican state of the type series.
DIAGNOSIS A member of the *fallax* group similar in various characters to the species listed above, distinguished as follows.
Major: dorsal profile of first two gastral tergites lined with a fringe of subrecumbent short hairs of equal length; humerus in dorsal-oblique view subangulate; rugoreticulum present on each side of the head as a broad swatch from eye to upper circular carinulae around antennal fossa; a patch of rugoreticulum also present around midline of occiput; entire promesonotum foveolate, and anterior pronotal dorsum carinulate.
Minor: posterior half of head dorsum smooth, but all of mesosoma and waist, and area mesad to eye, foveolate and opaque; occiput in frontal view weakly convex.
MEASUREMENTS (mm) Holotype major: HW 0.94, HL 1.00, SL 0.74, EL 0.16, PW 0.52.
Paratype minor: HW 0.52, HL 0.60, SL 0.72, EL 0.14, PW 0.36.
COLOR Holotype major (San Luis Potosi): gaster light brown, rest of body reddish yellow, with dark area on vertex and mid-occiput, as illustrated.
Paratype minor (San Luis Potosi): concolorous yellowish brown.
Paratype major (Nuevo León): concolorous medium brown, with slight reddish tinge.
Paratype minor (Nuevo León): plain light brown.
RANGE In addition to the types from San Luis Potosi, central Mexico, I have also seen material from Cola de Caballo, Nuevo León, in the northeast of Mexico.
BIOLOGY The San Luis Potosi type colony was collected from tropical deciduous forest.

Compare with *astur, oxyops, trageri*

FIGURE Upper: major. Lower: minor. COLOMBIA: Barranquilla (Auguste Forel). Major compared with holotype major in Muséum National d'Historie Naturelle, Paris; the specimen is labeled "Island, Colombia, 1820" and lacks the waist and gaster). Scale bars = 1 mm.

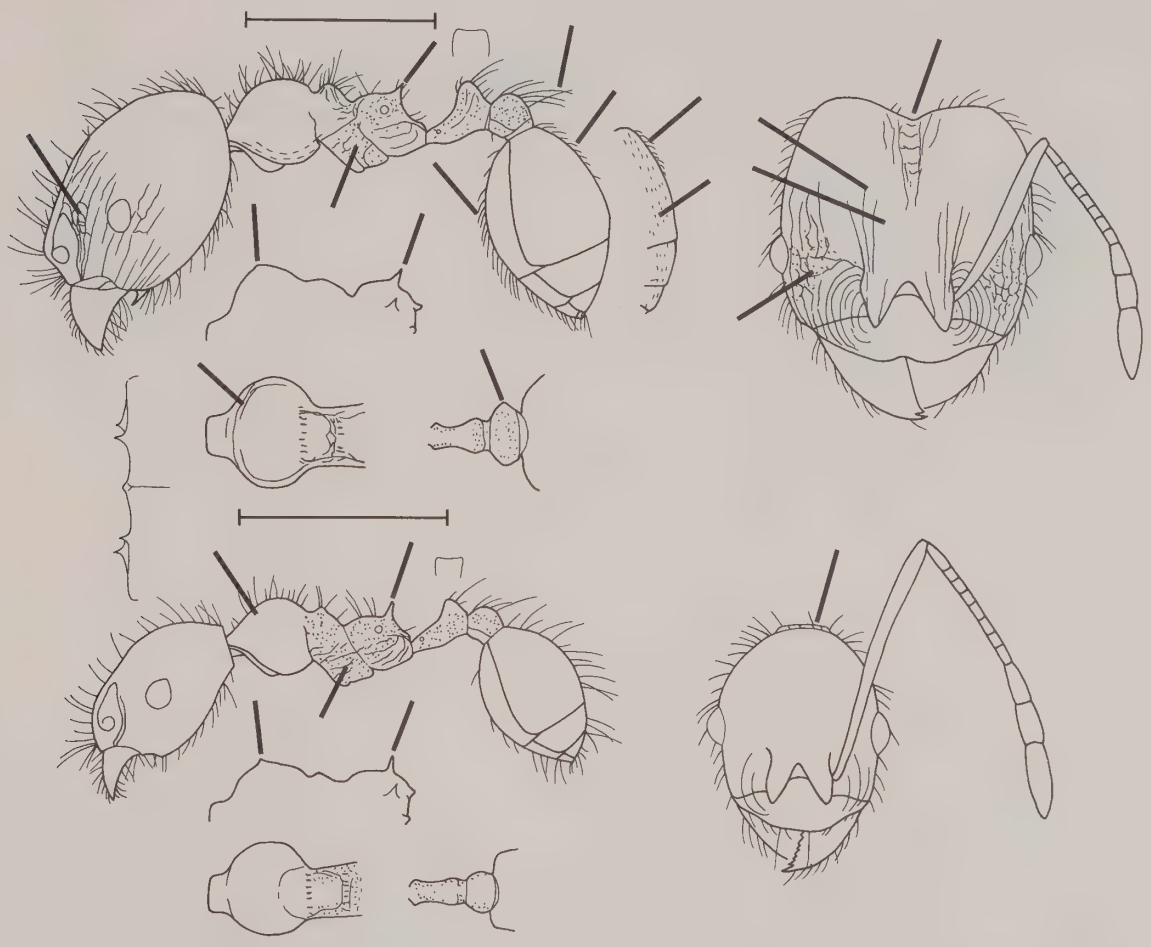


Pheidole praeusta Roger

Pheidole praeusta Roger 1863a: 197.

TYPES Mus. National Hist. Nat. Paris.
ETYMOLOGY Unknown.
DIAGNOSIS A member of a complex of *Pheidole* species, with giant majors and short bristly hair, in the larger *fallax* group comprising *astur, oxyops, praeusta,* and *trageri*; *praeusta* is distinguished among them by the following combination of traits.
Major: rugoreticulum lacking on head; carinulae immediately next to the midline of the dorsal surface of the head reach the occiput; occipital lobes smooth and shiny; mesonotal convexity prominent; propodeal spines small, thin, and vertical to the basal propodeal face; postpetiolar node seen from above elliptical, with angulate lateral margins; anterior and lateral margins of pronotal dorsum transversely carinulate; propodeum completely carinulate.
Minor: occiput narrowed somewhat, with nuchal collar; dorsal margin of petiolar node bidentate in rear view; propodeal spine reduced to denticle; pronotum entirely smooth and shiny.
MEASUREMENTS (mm) Holotype major (Mus. National Hist. Nat. Paris): HW 2.34, HL 2.78, SL 1.10, EL 0.30, PW 0.92.
Minor (Barranquilla, Colombia): HW 0.60, HL 0.78, SL 0.96, EL 0.16, PW 0.42.
COLOR Major: concolorous reddish yellow ("orange").
Minor: body reddish brown except for gaster, which is dark brown.
RANGE Known only from the two localities listed above in Colombia, as well as at the Rancho de Volador, near Dibulla, also in Colombia.
BIOLOGY The nests of *praeusta* found by Forel at Barranquilla and Dibulla had a unique structure. The nest entrance of each was a convoluted slit surrounded by a narrow elevated earthen wall, 2 cm high off the level of the surrounding soil, 4 to 6 cm in diameter, and turning outward toward the upper rim, and overall "resembling the calyx of a large monopetalous flower." Forel did not comment on the matter, but the *praeusta* entrance and superstructure are remarkably similar to the fortified cerumen nest entrances of some meliponine bees.

FIGURE Upper: holotype, major. Lower: paratype, minor (tentatively associated). MEXICO: Los Tuxtlas, 10 km north-northwest of Sontecomapan, Veracruz, 18°35′N 95°05′W, 500 m (Philip S. Ward). Scale bars = 1 mm.

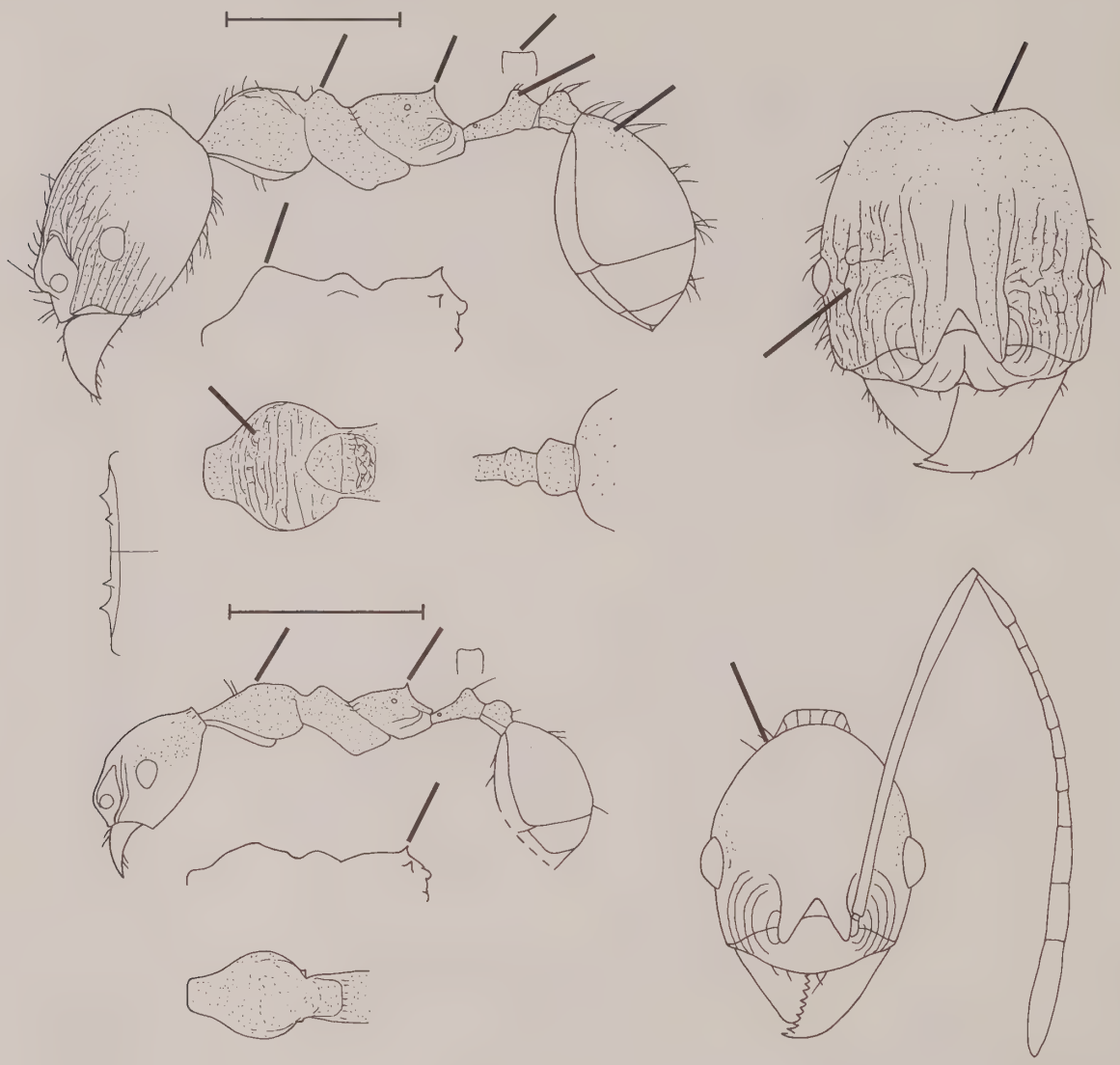


Pheidole psilogaster **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *psilogaster,* bare stomach (gaster of ant).
DIAGNOSIS A member of the *fallax* group, very similar to *potosiana* and less so to the other species listed in the heading above.
Major: first gastral tergite covered with short recumbent hairs of even length, and anterior half also by a dense layer of short subrecumbent hairs all of approximately the same length; gastral sternites covered by dense subrecumbent hairs all of which are the same medium length; head and body concolorous light reddish brown; mesopleuron with broken short rugulae; rugoreticulum on head stretches on each side from eye to antennal fossa; carinulae extend posteriorly to eye only a little more than 2× Eye Length, except for those adjacent to midline, which travel from vertex to occiput; humerus in dorsal-oblique view subangulate.
Minor: occiput narrowed with nuchal collar; humerus in dorsal-oblique view denticulate; propodeal spines thin and vertical to basal propodeal space; mesopleuron carinulate.
MEASUREMENTS (mm) Holotype major: HW 0.94, HL 1.00, SL 0.82, EL 0.16, PW 0.52.
Paratype minor: HW 0.58, HL 0.70, SL 0.90, EL 0.12, PW 0.38.
COLOR Major: concolorous light reddish brown.
Minor: body concolorous plain medium brown; appendages light to yellowish brown except for tarsi, which are yellow.
RANGE Known from the type locality, as well as from the Kukra River, Nicaragua (Ivette Perfecto).
BIOLOGY The type colony was collected from sifted litter, leaf mold, and rotting wood in a rainforest.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major (antennae missing from specimen). Lower: paratype, minor.
BRAZIL: Petrópolis, Rio de Janeiro. Scale bars = 1 mm.

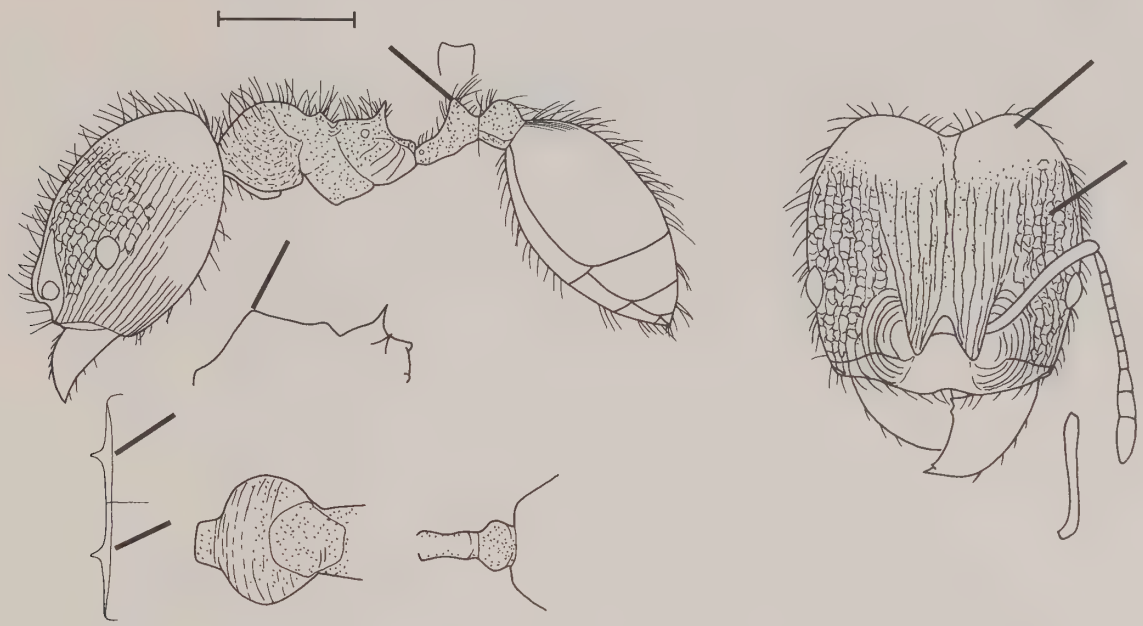


Pheidole punctithorax Borgmeier

Pheidole punctithorax Borgmeier 1929: 210.

TYPES Mus. Zool. Univ. São Paulo.
ETYMOLOGY L *punctithorax,* punctate chest, evidently referring to the wholly foveolate mesosomas of both castes.
DIAGNOSIS A member of the "*jujuyensis* complex" of the larger *fallax* group, comprising *araneoides, cuevasi, durionei, jujuyensis, kugleri, leonina, leptina, lucretii, lupus, paraensis, punctithorax, tijucana, wallacei,* and *wolfringi,* which complex is characterized by slender body form and exceptionally long scapes and petiolar pedicel; also in the major by a proportionately small head; and in the minor by a strongly developed nuchal collar. *P. punctithorax* is distinguished as follows.
Major: pilosity sparse; occiput narrowed so that its width in full face is much less than that of the clypeus; a loose, large-celled rugoreticulum is limited to the space mesad to the eyes and forward of it; the humerus and petiolar node are subangulate; all of the occiput, mesosoma, and waist are foveolate and opaque; anterior third of first gastral tergite is shagreened and opaque.
Minor: all of mesosoma and waist, as well as a strip running from the eye to the occiput, foveolate and opaque; neck only moderately narrowed.
Major and **minor**: reddish brown.
MEASUREMENTS (mm) Holotype major: HW 1.24, HL 1.32, SL (antennae missing), EL 0.22, PW 0.64.
Paratype minor not measured.
COLOR Major: concolorous medium reddish brown.
Minor: gaster light reddish brown, rest of body and appendages medium reddish brown.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Lectotype, major. BRAZIL: Rio de Janeiro (Hubert Puttemans). (There are no minors in the type series; see Diagnosis below.) Scale bar = 1 mm.



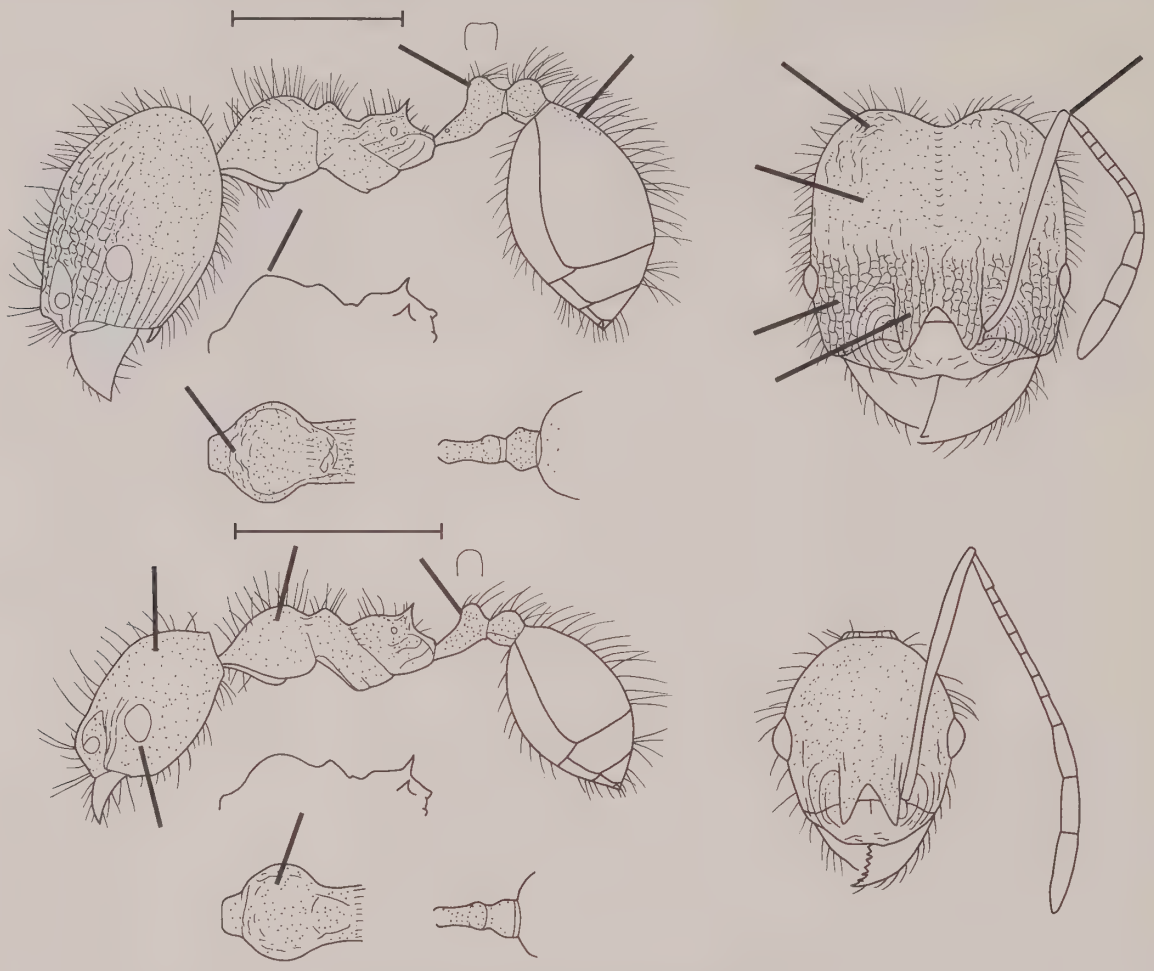
Pheidole puttemansi Forel, **new status**

Pheidole fallax subsp. *puttemansi* Forel 1911e: 304. Syn.: *Pheidole fallax* r. *janeirensis* Forel 1912g: 222, n. syn.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY Named after the collector, Hubert Puttemans.
DIAGNOSIS A member of the *fallax* group close to *fallax, gigas, jelskii, obscurithorax, roushae, tobini,* and *valens,* differing as follows.
Major: entire posterior fifth of head, including occiput, smooth and shiny; lateral thirds of remainder of head in full-face view rugoreticulate, and median third, including frontal lobes, carinulate; humerus in dorsal-oblique view subangulate; petiole relatively slender, the apex of its node in side view tapering almost to a point; scapes relatively long (Scape Length/Head Width 0.64).
Minor (based on synonymous "r. *janeirensis,*" whose major was compared with the *puttemansi* lectotype): nearly identical to the *fallax* minor (as illustrated q.v.), with propodeal spines of intermediate length as depicted for that species.
MEASUREMENTS (mm) Lectotype major: HW 1.56, HL 1.64, SL 1.00, EL 0.22, PW 0.80.
COLOR Major: concolorous light reddish brown.
Minor: medium reddish brown.
RANGE Known from the vicinity of Rio de Janeiro, Pará; and, in Argentina, Siete Arboles, Estero del Santiago.
BIOLOGY Unknown.

Compare with *fallax, jelskii, obscurithorax, puttemansi, valens*

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: Sierra Teoviscocla, near Cuichapa, Veracruz, 1600 m (Cornell University Mexico Field Party, 1965). Scale bars = 1 mm.



Pheidole roushae **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named in honor of Sal Roush, in recognition of her outstanding contribution in service and support to tropical conservation, hence the habitats in which the Pheidole ants will continue to survive.

DIAGNOSIS A member of the *fallax* group, very distinct but with some similarities to *fallax, jelskii, obscurithorax, puttemansi,* and *valens,* recognizable as follows.

Major: reddish yellow; head quadrate; antennal scape very long, slightly surpassing occipital lobe in repose; frontal lobes rugoreticulate; all of space between eyes, circular carinulae of antennal fossae and anterior genal margins rugoreticulate; posterior half of head foveolate and opaque, with scattered, short, irregular rugulae scattered over the dorsal surface of the occipital lobes; petiolar node very thick in side view, its apex broadly rounded; anterior fourth of middle strip of first gastral tergite shagreened.

Minor: eye large and set well forward, its anterior margin only slightly more distant from the anterior clypeal margin than Eye Length; entire head, mesosoma, and waist foveolate; petiolar node in side view thick, its apex broadly rounded.

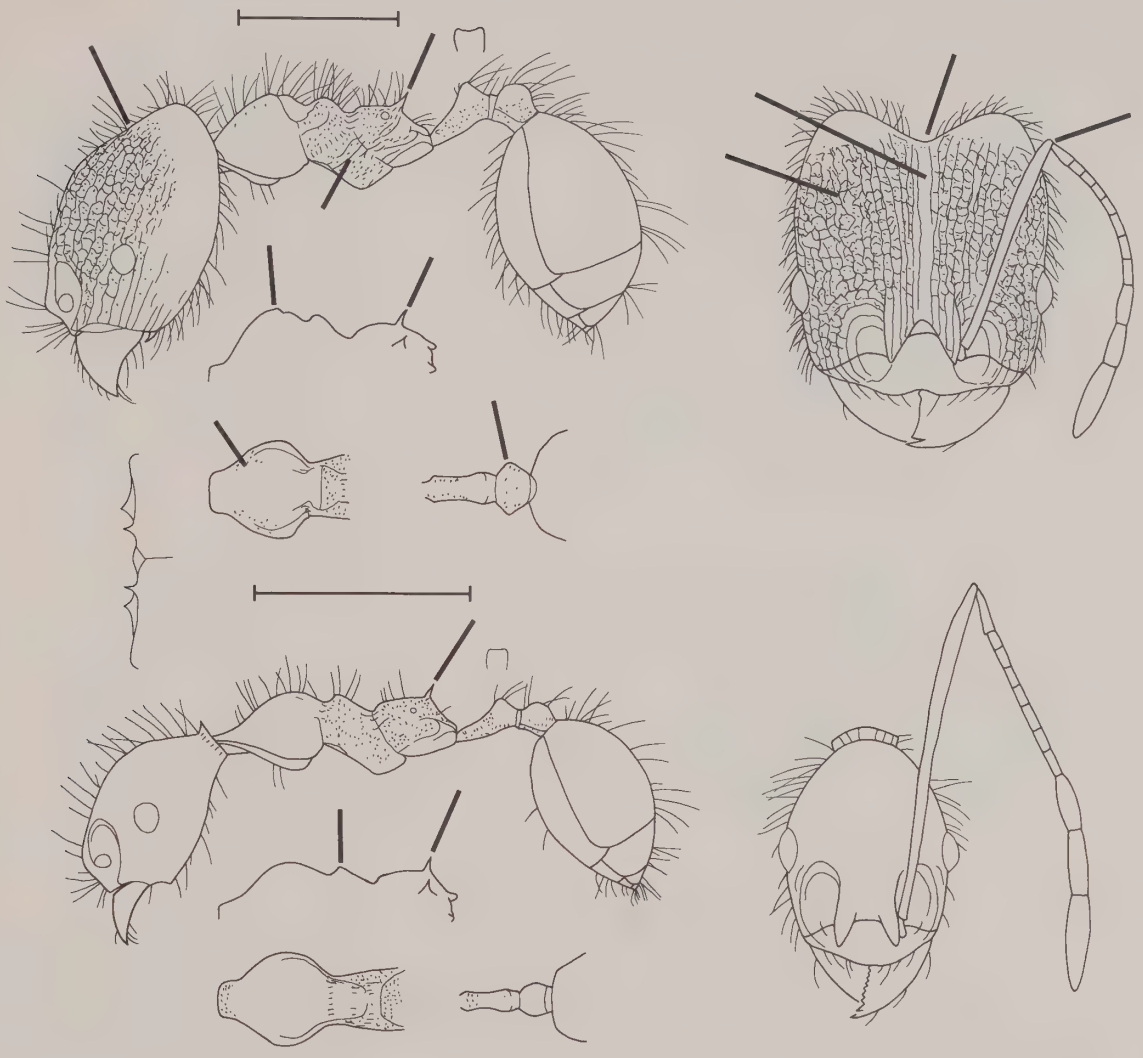
MEASUREMENTS (mm) Holotype major: HW 1.14, HL 1.20, SL 1.04, EL 0.20, PW 0.60.
Paratype minor: HW 0.60, HL 0.78, SL 1.04, EL 0.16, PW 0.44.

COLOR Major: reddish yellow ("orange").
Minor: concolorous medium yellow.

RANGE Known only from the type locality.

BIOLOGY The type series was collected in a shaded *cafetal,* a tropical forest with planted coffee.

FIGURE Upper: holotype, major. Lower: paratype, minor. VENEZUELA: Rancho Grande, 1100 m (R. W. Poole). Scale bars = 1 mm.

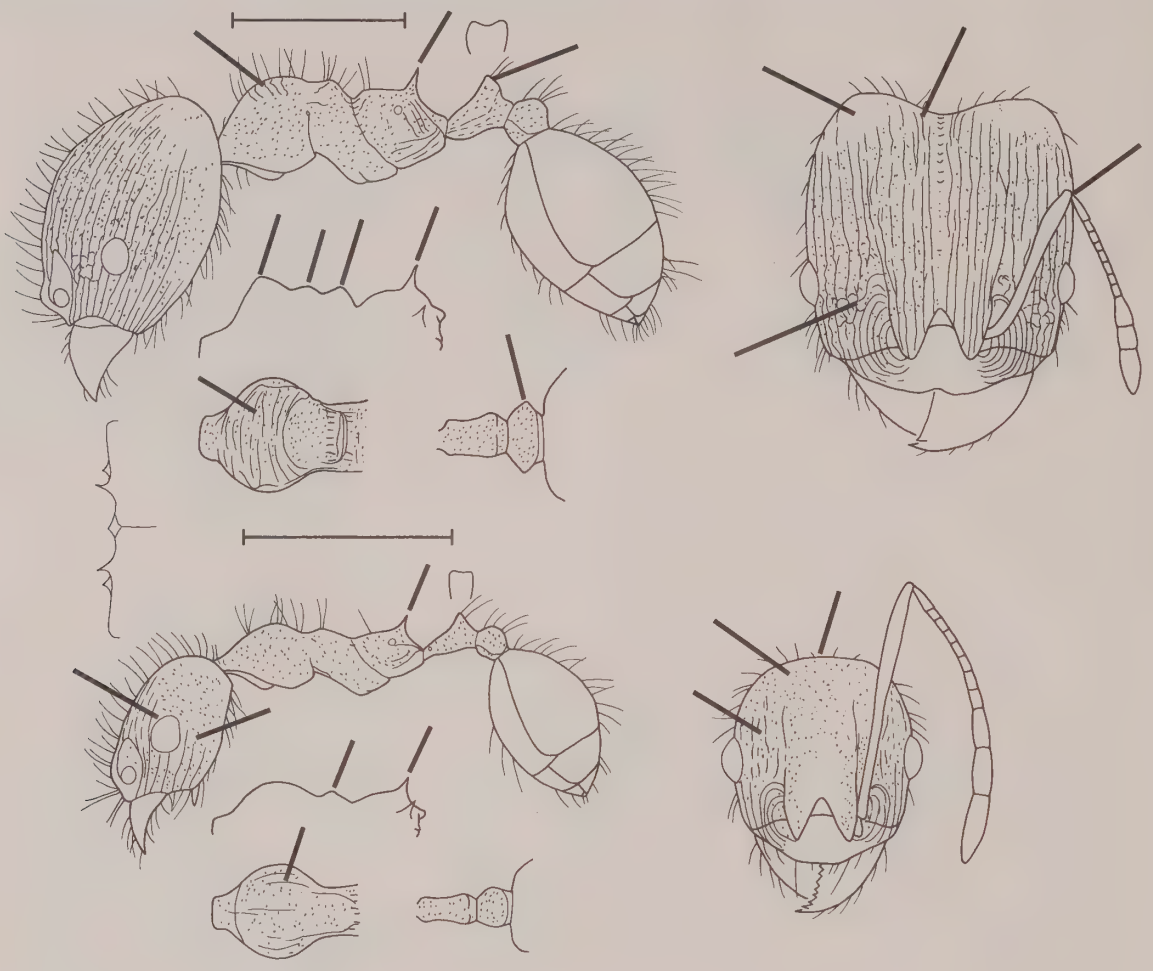


Pheidole rubiceps **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *rubiceps,* red-headed.
DIAGNOSIS A member of the *fallax* group, closest to *cardinalis, caribbaea, kukrana, mantilla,* and *obscurior* (also scan *alienata, fallax, jelskii, laniger, lattkei, lovejoyi, petrensis, puttemansi, roushae, susannae, tobini*), and distinguished by the following combination of traits.
Major: tip of antennal scape approaches occipital corner to within scape maximum width; posterior dorsal profile of head very weakly concave; bicolorous, with reddish yellow head and brown body; propodeal spine long and thin; postpetiole diamond-shaped; pronotum bare of carinulae.
Minor: propodeal spine moderately long and very thin (needle-like); mesonotal convexity angulate; nuchal collar present.
MEASUREMENTS (mm) Holotype major: HW 1.22, HL 1.36, SL 1.12, EL 0.20, PW 0.60.
Paratype minor: HW 0.60, HL 0.82, SL 1.20, EL 0.16, PW 0.42.
COLOR Major: bicolorous, with head and mandibles reddish yellow and body a contrasting plain medium brown; legs light brown except for tarsi, which are yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *optiva*

FIGURE Upper: paratype, major. Lower: paratype, minor. NEW MEXICO: Lordsburg (Arthur C. Cole). Scale bars = 1 mm.

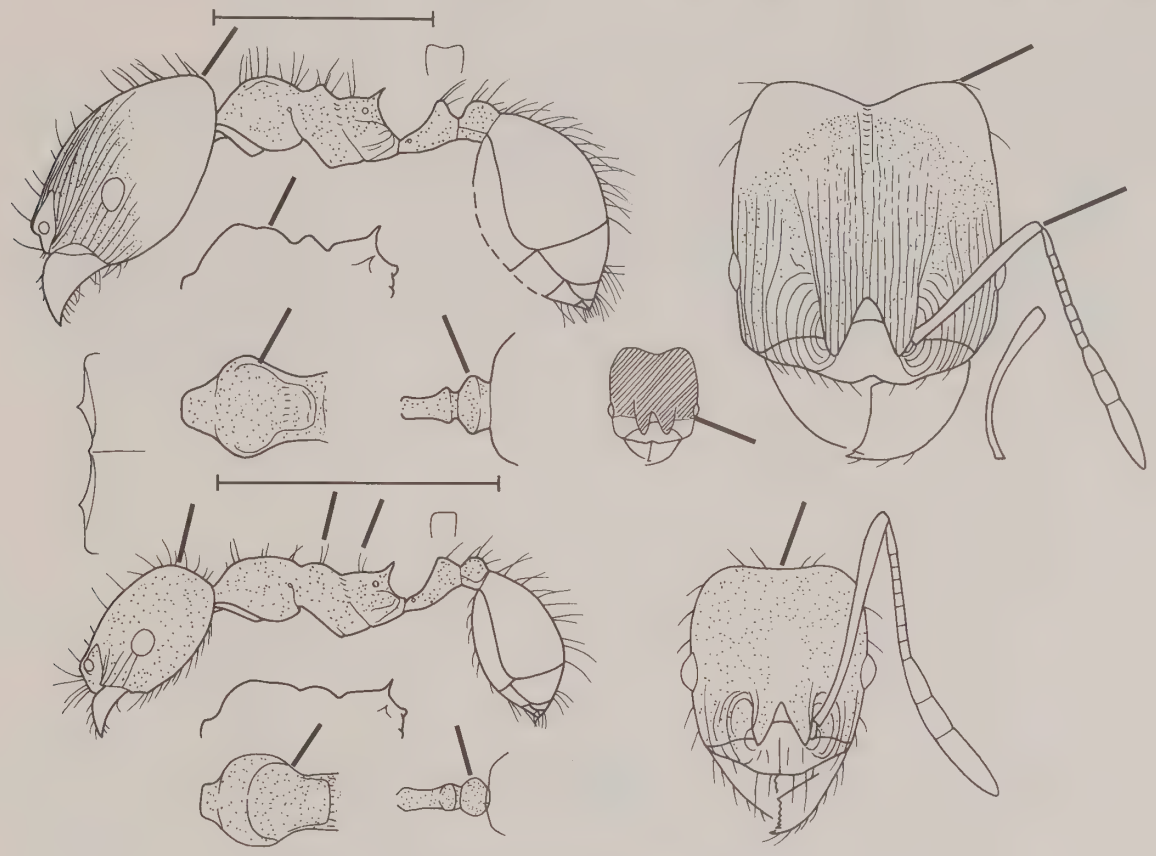


Pheidole sciara Cole

Pheidole sciara Cole 1955a: 47.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *sciara,* shaded, possibly alluding to color of the types.
DIAGNOSIS A member of the *fallax* group, somewhat similar to *optiva* of Mexico, distinguished as follows.
Major: in dorsal-oblique view, promesonotal dorsal profile with 3 roughly equal lobes (2 pronotal, 1 mesonotal); rugoreticulum on each side of head extends from eye to antennal fossa; central third of head dorsum, from frontal lobes to occiput, carinulate, and occipital lobes smooth; pronotal dorsum entirely carinulate; propodeal spines one third as long as and nearly vertical to basal propodeal face; postpetiole elliptical, with angulate lateral borders.
Minor: entire head, mesosoma, and waist foveolate and opaque; eyes large, Eye Length one-third Head Width.
MEASUREMENTS (mm) Paratype major: HW 1.48, HL 1.52, SL 0.86, EL 0.26, PW 0.80.
Paratype minor: HW 0.62, HL 0.76, SL 0.86, EL 0.20, PW 0.40.
COLOR Major: body light reddish brown except for gaster, which is plain medium to dark brown.
Minor: body plain medium brown, appendages light to medium brown.
RANGE West-central Texas to southwestern New Mexico.
BIOLOGY A colony found in Hidalgo County, New Mexico, by Stefan Cover (unpublished field notes) was in open desert with scattered mesquite, yucca, and *Ephedra,* occupying a soil nest with an entrance in a grass clump. A second colony was discovered by Cover nesting in open soil near Pecos, Texas, in saline desert among growth of *Limonium* and *Salicornia*. Nests reported by Moody and Francke (1982) in western Texas were at 600 to 1700 m and variously under stones and in open soil.

FIGURE Upper: lectotype, major. Some specimens have a weakly developed inner pair of hypostomal teeth in addition to the more conspicuous outer pair shown here. Lower: paralectotype, minor. TEXAS: Austin (William M. Wheeler). Scale bars = 1 mm.



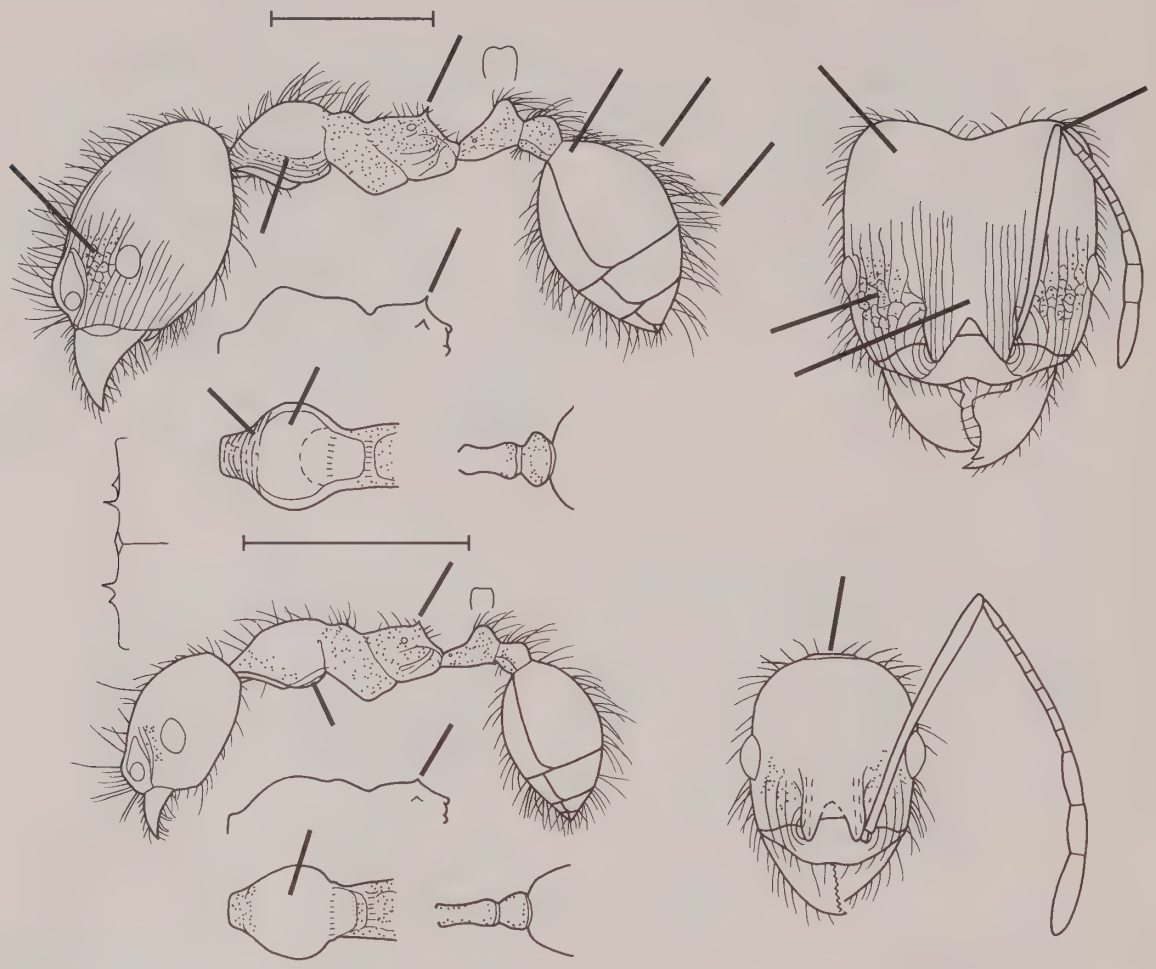
Pheidole sciophila Wheeler

Pheidole sciophila Wheeler 1908h: 443. Syn.: *Pheidole proserpina* Wheeler 1908h: 437, synonymy by Creighton and Gregg 1955: 19.
Pheidole sciophila var. *semilaevicephala* M. R. Smith 1934b: 385, synonymy by Creighton and Gregg 1955: 19.

TYPES Mus. Comp. Zool. Harvard; Amer. Mus. Nat. Hist.
ETYMOLOGY Gr *sciophila,* shade-lover, allusion unknown.
DIAGNOSIS An unusual species placed in the *fallax* group but with other traits in body form, including head form and antenna length that are intermediate to the *pilifera* group.
Major: head lacking rugoreticulum; bicolorous, reddish brown posteriorly and brownish yellow anteriorly; head in side view elliptical in outline, tapering conspicuously toward the occiput; antennal scape short, its tip in repose reaching halfway between the eye and occipital corner, seen in full face; pronotum weakly bilobous in dorsal-oblique view; mesonotal convexity strongly developed; all of mesosoma and waist foveolate and opaque.
Minor: gaster, clypeus, and frontal triangle smooth and shiny, and all the rest of the body foveolate and opaque; pilosity along dorsal profile of mesosoma mostly comprising evenly spaced pairs of setae.
The species exhibits considerable variation in body form and sculpturing, especially in the **major** caste, as noted by Creighton and Gregg (1955). The number of hypostomal teeth of the **major** is 3 or 5.
MEASUREMENTS (mm) Lectotype major: HW 1.04, HL 1.14, SL 0.64, EL 0.12, PW 0.56.
Paralectotype minor: HW 0.48, HL 0.58, SL 0.66, EL 0.08, PW 0.34.
COLOR Major: body and posterior three-fourths of the head a rich reddish brown, with the gaster a shade darker, and the anterior fourth of the head brownish yellow.
Minor: body plain medium brown, appendages brownish yellow.
RANGE Central Texas to deserts of southern Arizona and California and southward into Chihuahua, Mexico, at 100–1800 m.
BIOLOGY Stefan Cover, whose intensive collecting in the southwestern United States has brought him into frequent contact with *sciophila,* reports as follows (personal communication): "This ant is not commonly collected, in large part because its nests are inconspicuous. Entrances to soil nests are cryptic and they are often located at or near the bases of desert shrubs. They can be deep also: one nest excavated in SE Arizona (elev. 1300 m) in grazed desert penetrated 1.2 m into caliche nearly as hard as a Manhattan sidewalk. Colonies are monogynous and can consist of several hundred ants. *P. sciophila* appears to be omnivorous; no seeds have been found in many nests excavated in southern Arizona."

Compare with *ariel, desertorum, hyatti, portalensis, skwarrae, vistana*

FIGURE Upper: holotype, major. Lower: paratype, minor. TEXAS: 24 km northwest of Carrizo Springs, Dimmit Co. (O. F. Francke, J. V. Moody, F. W. Merickel). Scale bars = 1 mm.



Pheidole sitiens **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *sitiens,* thirsty, referring to life in the dry habitat of the type locality.

DIAGNOSIS A member of the *fallax* group, similar to the species listed in the heading above, distinguished as follows.

Major: antennal scape just attaining the occipital corner; propodeal spines equilaterally triangular; anterior and lateral margins of pronotum covered by continuous "wraparound" carinulae; posterior half and entire median strip of head, as well as promesonotal dorsum and all of gaster, smooth and shiny; pilosity dense, erect to suberect, and long, many of the hairs as long as Eye Length.

Minor: propodeal spines reduced to denticles; posterior half of head and all of pronotal dorsum and of gaster smooth and shiny; occiput slightly narrowed, with very thin nuchal collar.

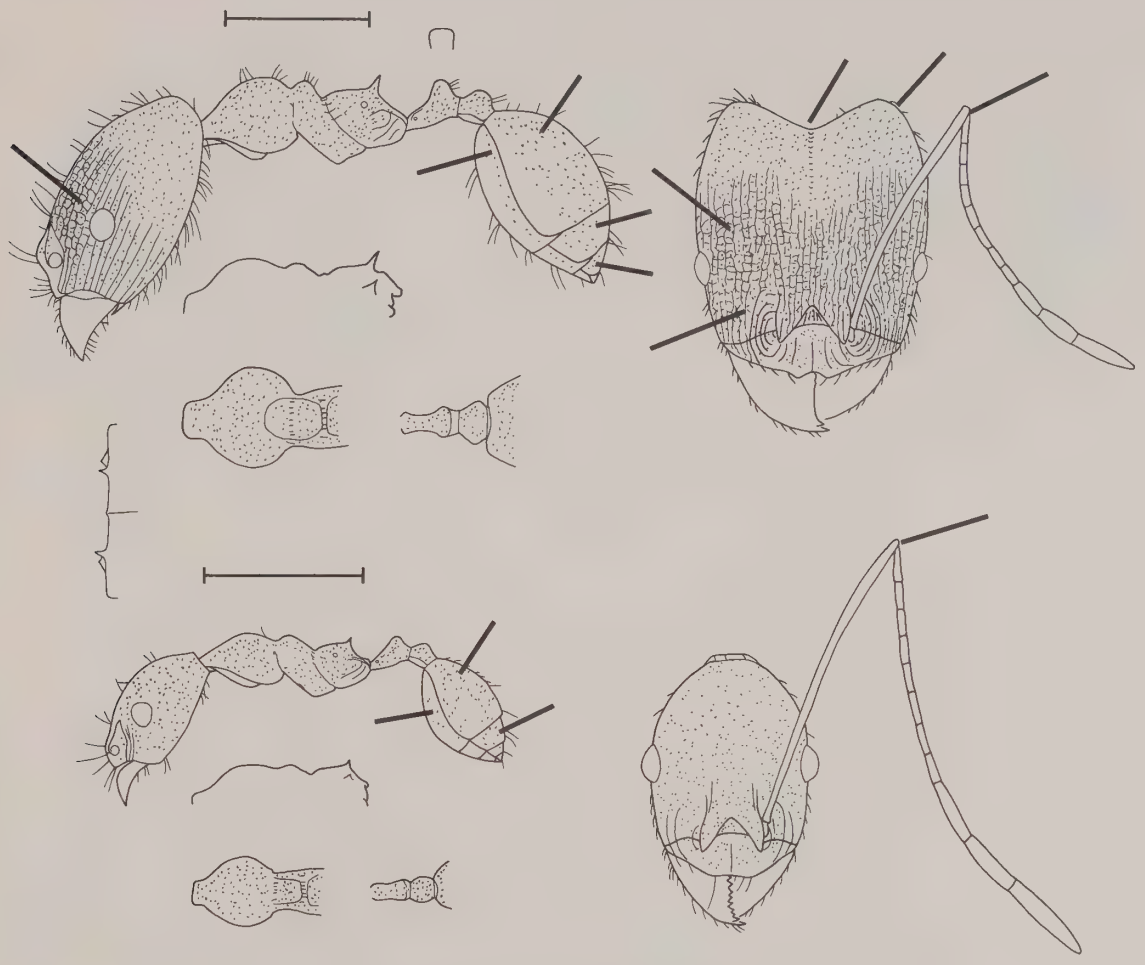
MEASUREMENTS (mm) Holotype major: HW 1.48, HL 1.60, SL 1.18, EL 0.24, PW 0.40.
Paratype minor: HW 0.60, HL 0.76, SL 0.96, EL 0.20, PW 0.40.

COLOR Major: concolorous light brownish brown.
Minor: body plain medium brown; mandibles and tarsi dark yellow; other appendages light brown.

RANGE Known only from the type locality.

BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. MEXICO: Cuernavaca, Morelos (Elisabeth Skwarra). Scale bars = 1 mm.



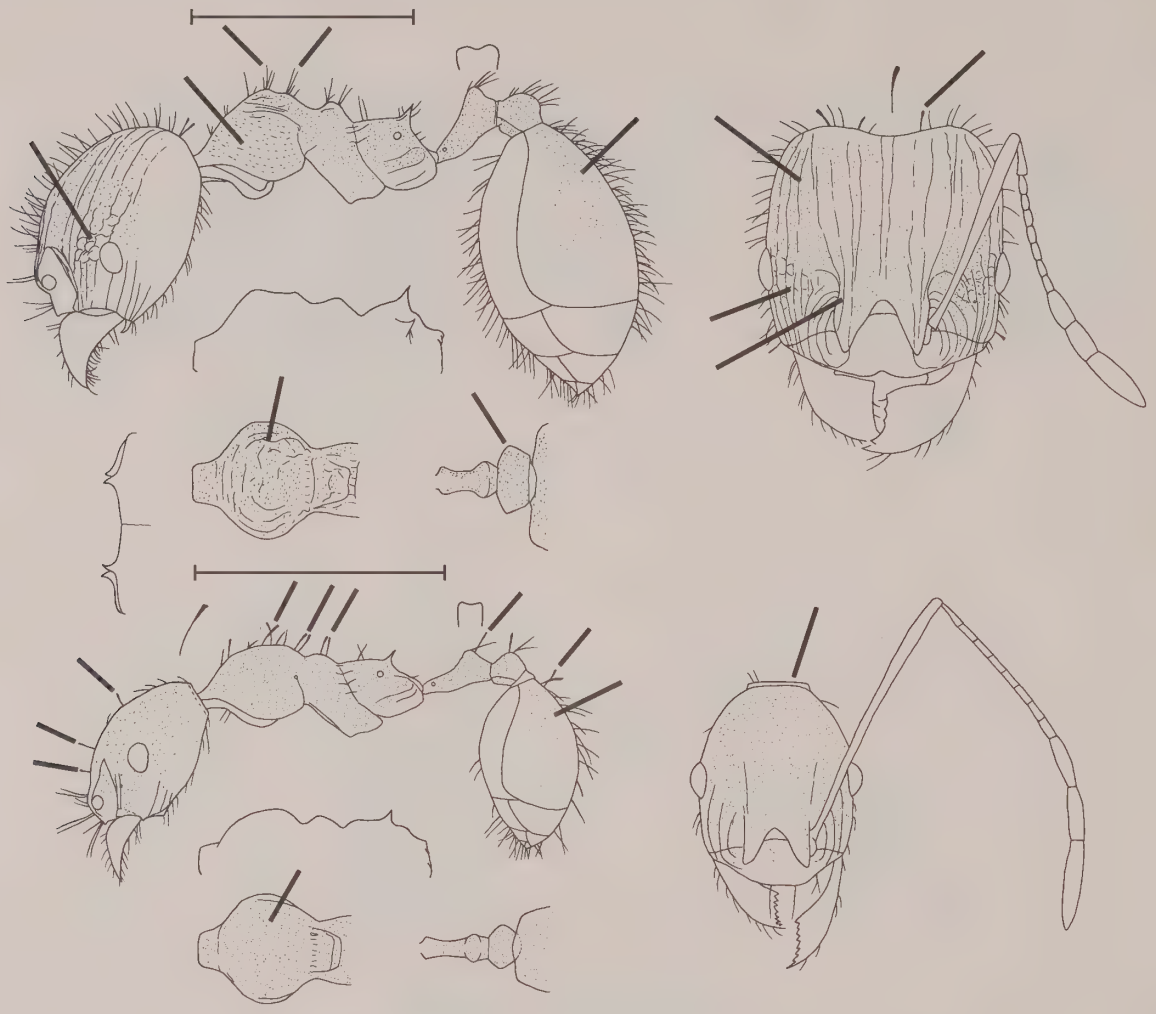
Pheidole skwarrae Wheeler

Pheidole skwarrae Wheeler 1934g: 163.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the collector, Elisabeth Skwarra.
DIAGNOSIS A member of the *fallax* group, closet to *vistana* and distinguished from it and other *fallax* group species by the following combination of traits.
Major: head elongate, with deep occipital cleft and subangulate occipital lobes in full-face view; antennal scape exceeding the occipital lobe by 2× its own maximum width; entire body, including all of the tergites and sternites of the gaster, foveolate and opaque; space between eye, frontal lobes, and frontal carinae rugoreticulate.
Minor: entire body, including at least the anterior two segments of the gaster, foveolate and opaque; nuchal collar well developed; antennal scape very long, extending 2× the distance between its insertion and nuchal collar.
MEASUREMENTS (mm) Lectotype major: HW 1.32, HL 1.60, SL 1.42, EL 0.24, PW 0.64.
Paralectotype minor: HW 0.54, HL 0.84, SL 1.20, EL 0.16, PW 0.42.
COLOR Major and minor: body concolorous medium brown, appendages yellowish brown.
RANGE Known only from the type locality.
BIOLOGY The type colony was nesting beneath a stone.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (Stefan Cover). Scale bars = 1 mm.



Pheidole spathipilosa **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *spathipilosa,* paddle-haired; see distinctive clavate hairs.

DIAGNOSIS A unique species of the *fallax* group somewhat similar to members of the "*jujuyensis* complex" comprising *araneoides, cuevasi, durionei, jujuyensis, kugleri, leonina, leptina, lucretii, lupus, paraensis, punctithorax, tijucana, wallacei,* and *wolfringi,* but easily distinguished as follows.

Major: clavate hairs present on occipital margin, as depicted; antennal scape slightly exceeds occipital corner in full-face view; widely spaced carinulae cover the outer halves of the frontal lobes and all of the posterior dorsal half of the head, including the occiput; pronotal dorsum foveolate and bearing scattered, short carinulae and rugulae; first gastral tergite weakly shagreened.

Minor: pilosity sparse, with many of the hairs along the dorsal profile of the head and body clavate; entire head and body foveolate; anterior third of first gastral tergite shagreened; occiput narrowed, with nuchal collar.

Both castes are tricolorous (see below).

MEASUREMENTS (mm) Holotype major: HW 0.94, HL 0.96, SL 0.78, EL 0.18, PW 0.54.

Paratype minor: HW 0.54, HL 0.70, SL 0.92, EL 0.18, PW 0.40.

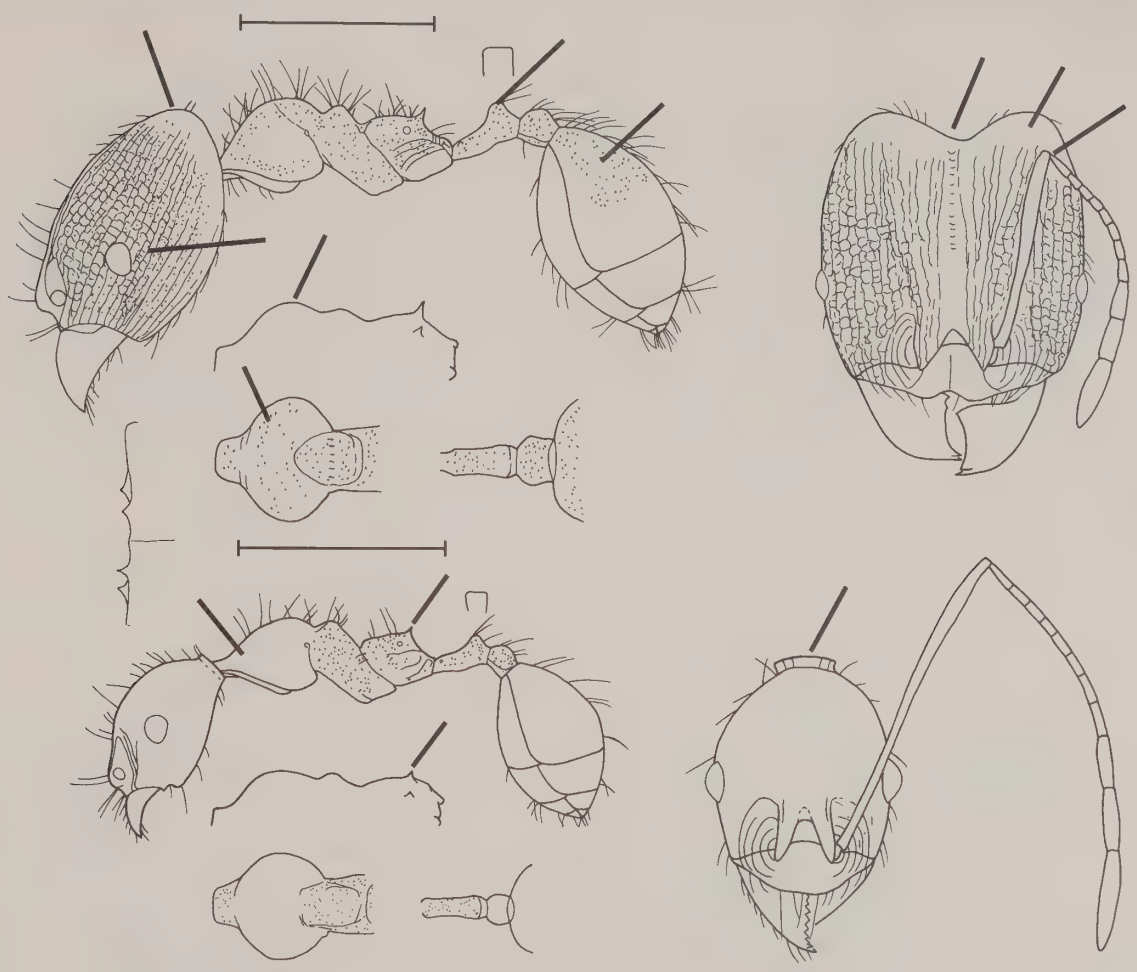
COLOR Major: tricolorous, with head and waist medium reddish brown, mesosoma and appendages light reddish brown, and gaster very dark brown.

Minor: tricolorous, with head and gaster dark reddish brown (gaster very dark), dorsum of pronotum and waist medium reddish brown, and mesosoma and appendages light reddish brown.

RANGE Known only from the type locality.

BIOLOGY Evidently a rare species. During intensive and independent bouts of collecting at the La Selva Biological Station, Stefan Cover and John T. Longino each found it only once. I later returned to the same spot in the forest where Cover collected the holotype nest series, and despite a close search in the vicinity failed to discover another colony. Males were present with the holotype series, on 27 March.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. GUATEMALA: Retalhuleu, Pacific slope. Scale bars = 1 mm.



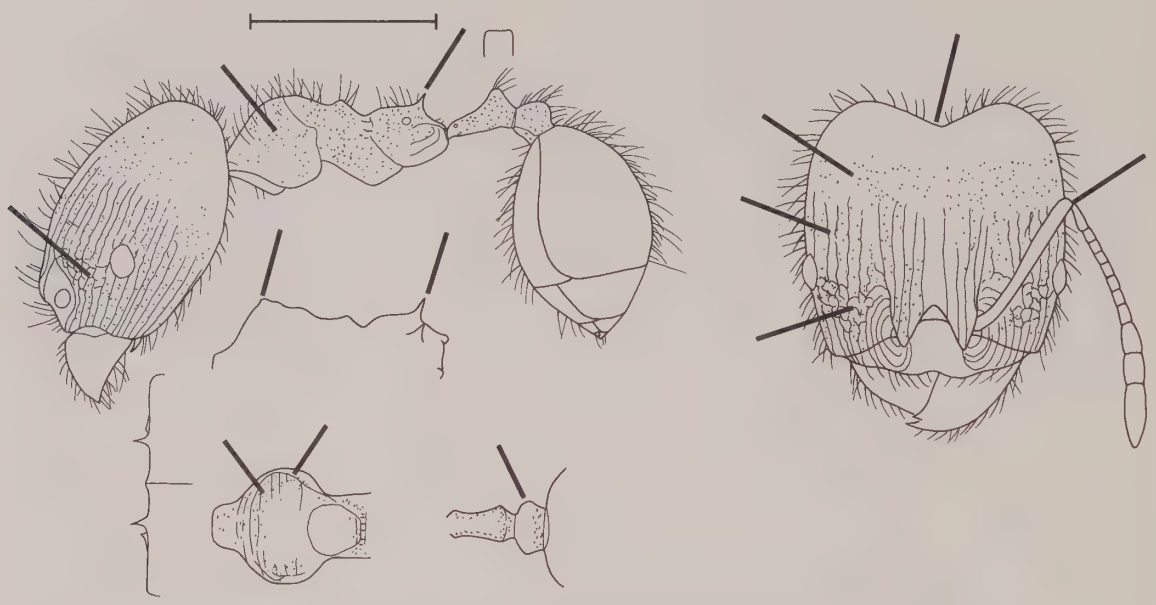
Pheidole susannae Forel

Pheidole susannae Forel 1886b: xliii. Syn.: *Pheidole susannae* r. *atricolor* Forel 1901j: 356, n. syn. Raised to species level in this monograph: *obscurior*.

TYPES Mus. Hist. Nat. Genève; Mus. Comp. Zool. Harvard.
ETYMOLOGY Eponymous, no attribution given.
DIAGNOSIS A member of the *fallax* group, most similar to *haskinsorum, lattkei, obscurior, petrensis,* and distinguished as follows.
Major: in both side and frontal views, head tapered conspicuously toward occiput; occipital cleft deep, antennal scape failing to reach the occipital corner by about 2× the maximum scape width; pilosity fringing side and frontal profiles posterior to eye level subrecumbent; rugoreticulum extensive all around the eye; anterior half of first gastral tergite shagreened and opaque; humerus in dorsal-oblique view low and smoothly rounded.
Minor: pronotum entirely smooth; occiput moderately narrowed, with nuchal crest; propodeal spines reduced to denticles.
A highly variable species that may in time prove to be a complex of sibling species.
MEASUREMENTS (mm) Lectotype major: HW 1.30, HL 1.44, SL 1.06, EL 0.20, PW 0.60.
Paralectotype minor: HW 0.54, HL 0.82, SL 1.12, EL 0.14, PW 0.40.
COLOR Major: body reddish yellow, gaster a slightly contrasting light reddish brown.
Minor: concolorous medium yellow. Other series vary from reddish yellow to dark brown.
RANGE Ranging from Veracruz, Mexico, south to Colombia, Venezuela, and Trinidad. I have also verified a record from Cayo Congo, Puerto Rico (J. A. Torres). Kempf (1972b) cites the species from Rio Grande do Sul, a doubtful record I have not been able to check.
BIOLOGY This widespread species is also very adaptable in habitat and nest site. In Colombia colonies have been found variously in forests and pastures. In Costa Rica, Longino (1997) reports *susannae* nesting under the bark and into an abandoned termite nest at the base of a large tree and in cracks in the floor of a housing unit near the La Selva Biological Station forest. I found it nesting behind a concrete curb inside a San José, Costa Rica, city park, foraging during the day. On Barro Colorado Island, Panama, I observed a nuptial flight in progress in tropical evergreen forest at 1600 hrs; males were emerging in the company of minors and majors from a crevice in the trunk of a tree 1–2 m from the ground.

Compare with *chiapasana, dentata, humeridens, industa, laeviventris, madrensis, maja*

FIGURE Holotype, major. [Paratype minors closely resemble minors of *tetra* (q.v.).] MEXICO: 38 km southeast of Tepic, Nayarit, 1220 m (R. J. Hamton). Scale bar = 1 mm.



Pheidole tetroides **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *tetroides,* similar to *tetra* (species of *Pheidole*), four, significance unknown.

DIAGNOSIS A member of the *fallax* group resembling the species listed in the heading above in various characters, distinguished as follows.

Major: in full-face view the occipital margin is deep, with a subangular nadir; rugoreticulum of head extends in a swath from eye to antennal fossa; carinulae of dorsal surface of head extend almost to midpoint between level of eyes and level of occiput, and foveolation extends well beyond the midpoint; humerus in dorsal-oblique view angulate, and pronotal profile bilobose; propodeal spines strongly developed; postpetiole from above elliptical, with angulate lateral margins; anterior and posterior margins of pronotal dorsum carinulate.

Minor: closely resembles that of *tetra* in the *crassicornis* group (q.v.).

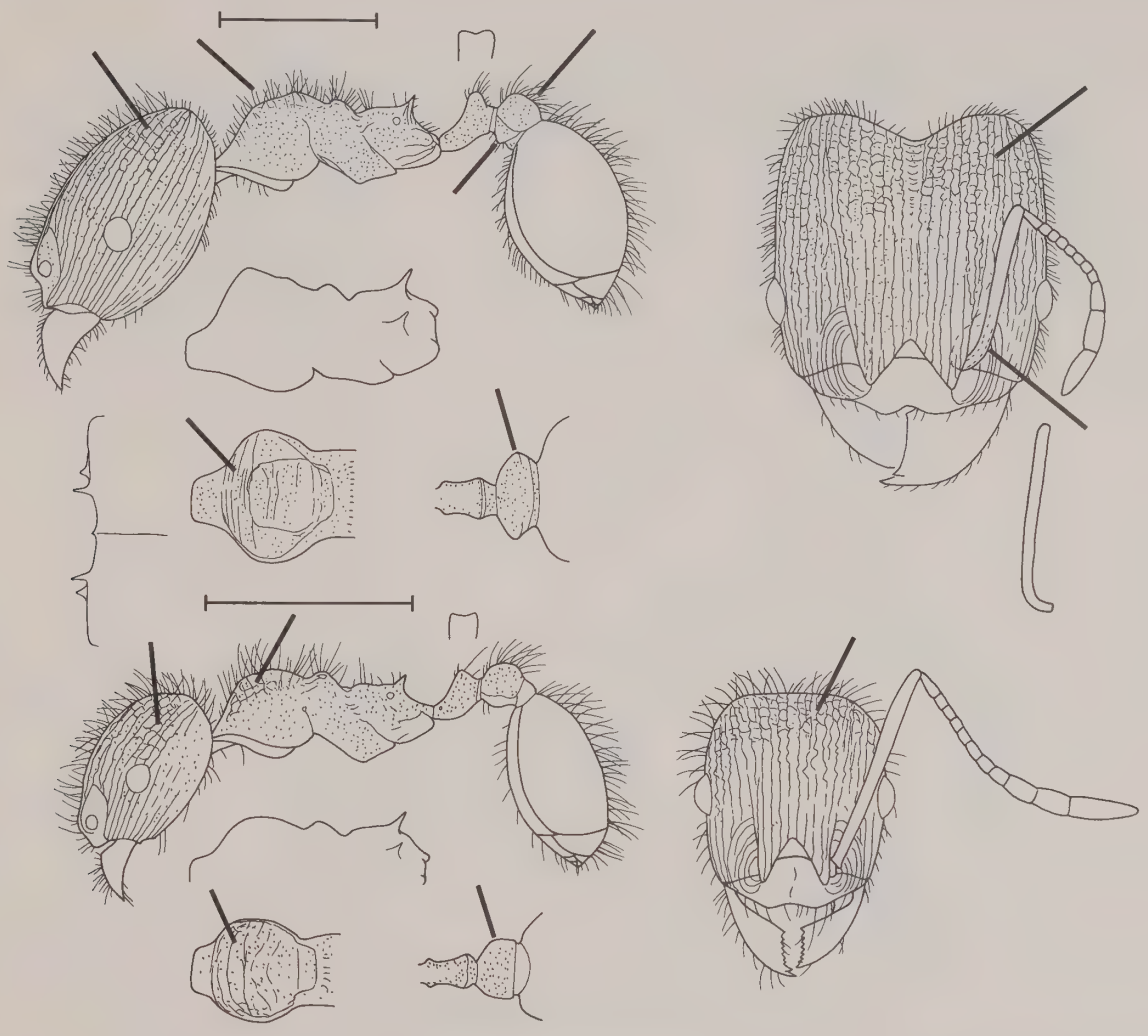
MEASUREMENTS (mm) Holotype major: HW 1.16, HL 1.24, SL 0.76, EL 0.18, PW 0.64.
Paratype minor: HW 0.56, HL 0.66, SL 0.76, EL 0.14, PW 0.40.

COLOR Major: light reddish brown except for gaster, which is medium reddish brown.
Minor: concolorous plain medium brown; appendages light brown, changing to yellow on the tarsi.

RANGE Known only from the type locality.

BIOLOGY The types were attracted to a bait at night.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. TEXAS: Austin, Travis Co. (W. M. Wheeler). Scale bars = 1 mm.

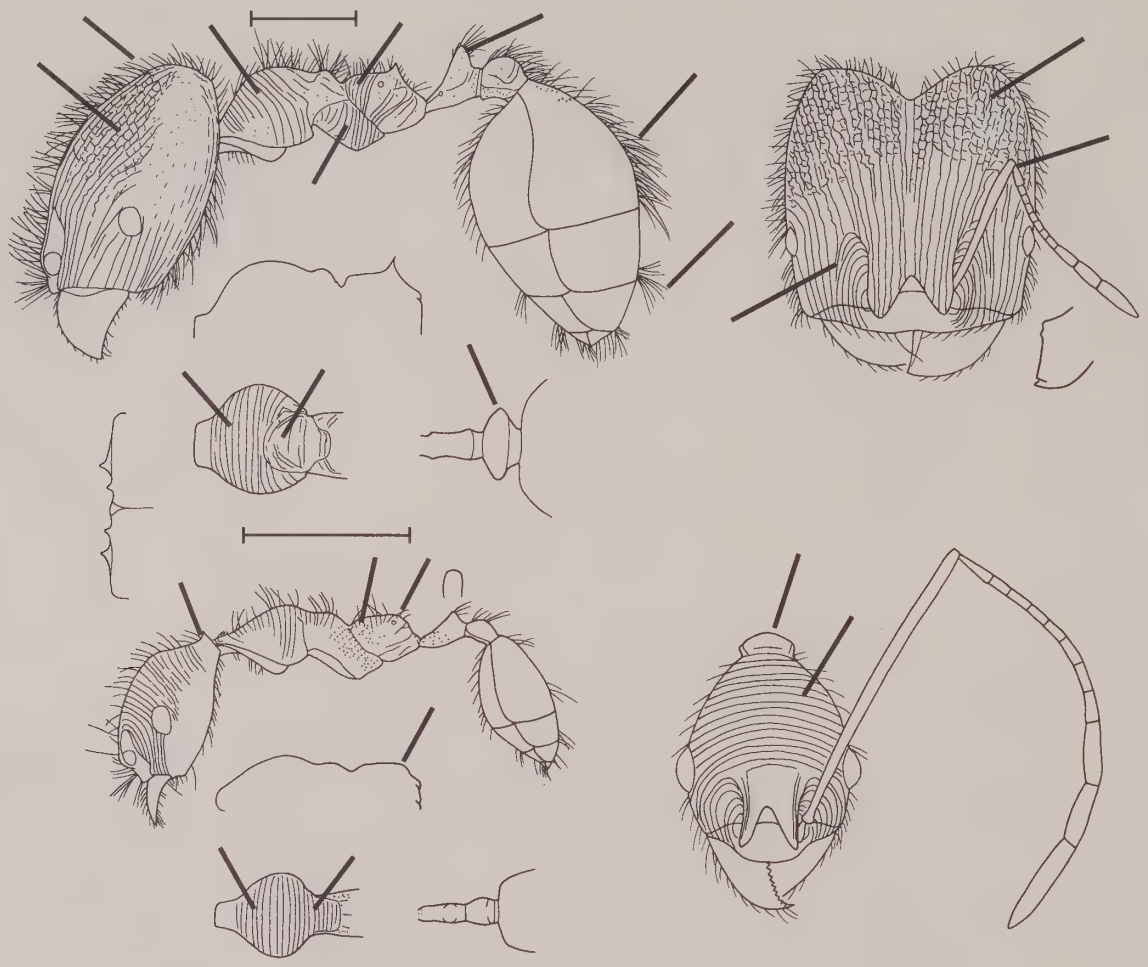


Pheidole texana Wheeler

Pheidole texana Wheeler 1903c: 97.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after state of origin of type colony.
DIAGNOSIS A member of the *fallax* group, distinguished by the following combination of traits.
Major: posterior third of dorsal surface of the head rugoreticulate; scape slightly expanded at the base; promesonotal dorsum transversely carinulate; postpetiolar node from above very wide, and elliptical; small subpostpetiolar process present.
Minor: occiput rugoreticulate; promesonotal dorsum transversely carinulate; postpetiole from above very broad, and bell-shaped; mesosoma, waist, and all head except frontal triangle and middle of clypeus foveolate and opaque.
MEASUREMENTS (mm) Lectotype major: HW 1.40, HL 1.54, SL 0.86, EL 0.26, PW 0.74.
Paralectotype minor: HW 0.68, HL 0.78, SL 0.84, EL 0.16, PW 0.48.
COLOR Major and minor: concolorous light reddish brown.
RANGE Known from the type locality, as well as Sutton and Uvalde Counties in western Texas.
BIOLOGY *P. texana* is evidently a rare species. Wheeler (1903c) discovered only four colonies over many years' collecting, and all in Travis County, Texas; all were in grassland, nesting in open soil, with the entrances surmounted by small mounds about 10 cm in diameter. During their intensive collecting in western Texas, Moody and Francke (1982) found only two colonies, nesting in open, fully exposed clayey loam.

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: 10 km south of San José del Palmer, Rio Torito, Chocó (Charles Kugler). Scale bars = 1 mm.



Pheidole tigris **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *tigris,* tiger, i.e. "striped" like one with carinulae.

DIAGNOSIS A large, very distinctive member of the *fallax* group, recognizable as follows.

Major: "orange"; almost all of promesonotal and propodeal dorsa, as well as mesopleuron, covered by transverse carinulae; entire rear third of head, including occiput, rugoreticulate; and almost all the anterior two-thirds of the head carinulate, with no accompanying rugoreticulum; petiolar node from the side very high, strongly tapered toward the apex; postpetiolar node 2× broader than petiolar node from above, and elliptical in shape; body everywhere densely pilose.

Minor: yellow; all of posterior dorsal half of head and all of mesosomal dorsum transversely rugulose; propodeal spine absent; occiput drawn into a neck with broad nuchal collar.

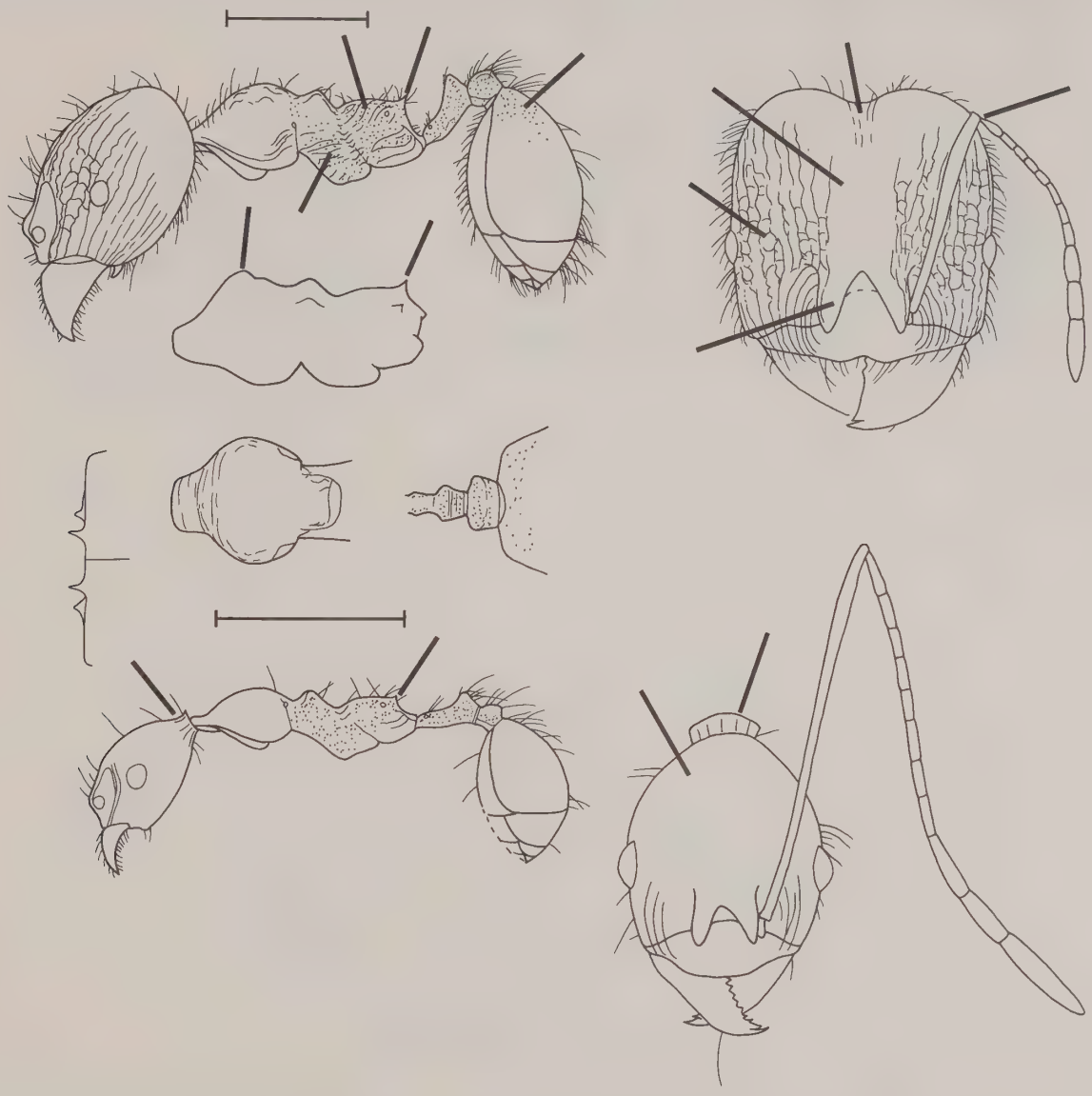
MEASUREMENTS (mm) Holotype major: HW 2.16, HL 2.28, SL 1.22, EL 0.34, PW 1.04.
Paratype minor: HW 0.61, HL (including collar) 0.90, SL 1.34, EL 0.10, PW 0.50.

COLOR Major: body and antennae very light reddish brown ("orange"), with a dark reddish brown stripe running the length of the midline of the head anteriorly to include the frontal triangle; legs dark reddish yellow.
Minor: concolorous yellow.

RANGE Known only from the type locality.

BIOLOGY The type colony was found in spring bamboo *(Guadua)* forest, nesting in a rotting log. A seed cache and males were present in the nest at the time of collection, 1–4 June.

FIGURE Upper: syntype, major. Lower: syntype, minor. BRAZIL: Tijuca, Guanabara, Rio de Janeiro. Scale bars = 1 mm.



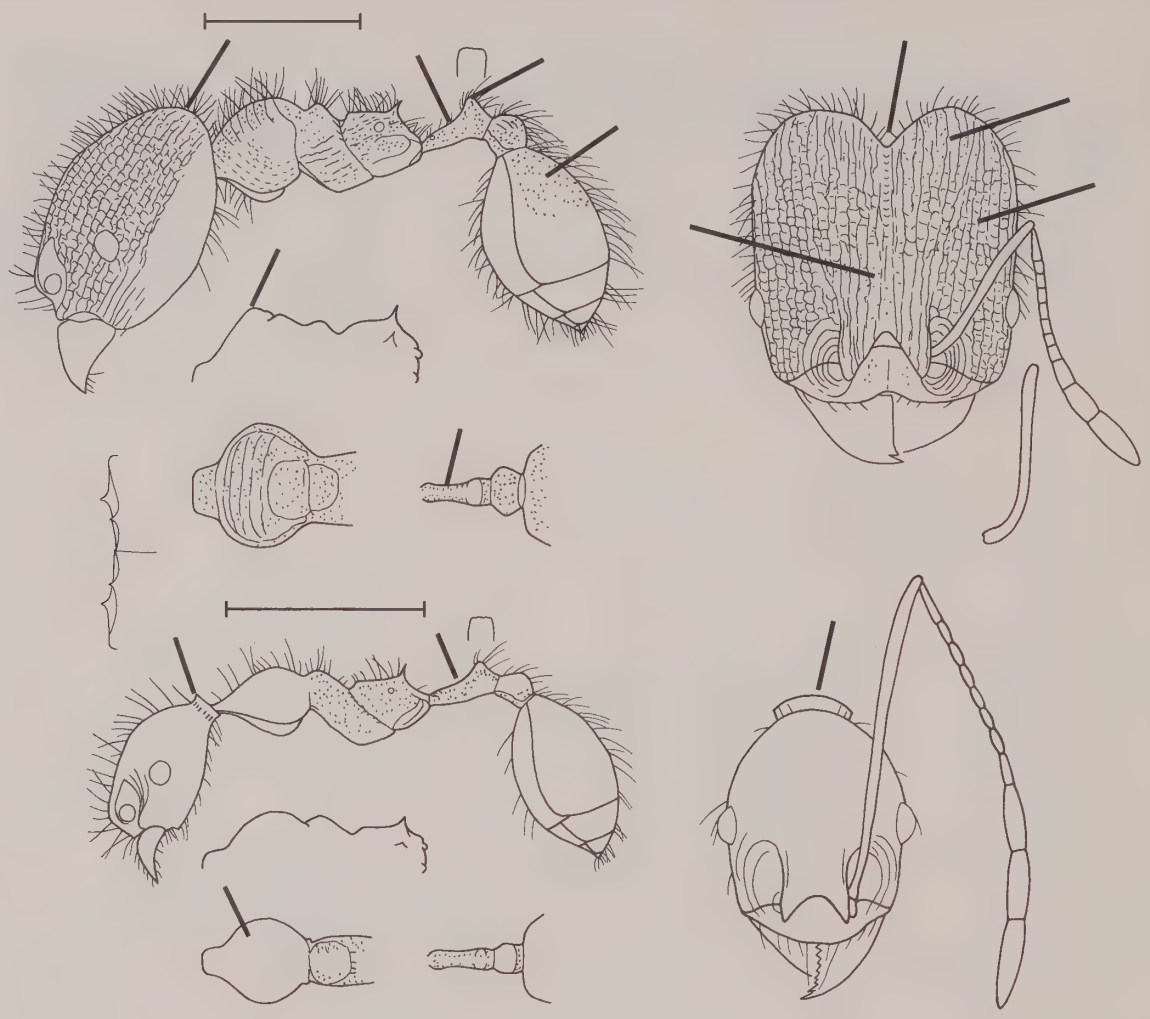
Pheidole tijucana Borgmeier

Pheidole tijucana Borgmeier 1927b: 59.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the type locality.
DIAGNOSIS A member of the "*jujuyensis* complex" of the larger *fallax* group, comprising *araneoides, cuevasi, durionei, jujuyensis, kugleri, leonina, leptina, lucretii, lupus, paraensis, punctithorax, tijucana, wallacei,* and *wolfringi.*
P. tijucana is distinguished as follows.
Major: scape just attains occipital border; most of occiput vertex, and frontal lobes smooth and shiny; a small cluster of short longitudinal carinulae are gathered around midline at occiput; rugoreticulum on each side of head extends from eye to antennal fossa, anteriorly halfway between eye and anterior border of head, and posteriorly to halfway between eye and occipital border; mesopleuron and most of propodeum carinulate; propodeal spines equilaterally triangular.
Minor: propodeal spines reduced to denticle; occiput constricted to neck with broad nuchal collar.
MEASUREMENTS (mm) Holotype major: HW 1.48, HL 1.54, SL 1.08, EL 0.22, PW 0.76.
Paratype minor: HW 0.58, HL 0.74, SL 1.14, EL 0.16, PW 0.44.
COLOR Major: concolorous rich reddish brown.
Minor: plain light brown except for head, which has a darker, reddish shade.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *fallax, jelskii, obscurithorax, puttemansi, roushae, valens*

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios (Stefan Cover and John E. Tobin). Scale bars = 1 mm.



Pheidole tobini **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after John E. Tobin, one of the collectors, and a student of the Amazon arboreal ant fauna.

DIAGNOSIS A member of the *fallax* group, similar to *fallax, jelskii, obscurithorax, puttemansi, roushae,* and *valens,* and distinguished as follows.

Major: dark brown; head narrowed toward occiput in side view, and subrectangular in full-face view; occipital cleft deep; posterior fourth of head, including occiput, and frontal lobes longitudinally carinulate, contrasting with the mostly rugoreticulate anterior three-fourths of the head; humerus in dorsal-oblique view subangulate; petiolar peduncle thin, and node in side view tapering almost to a point at the apex; anterior half of the first gastral tergite shagreened and opaque.

Minor: occiput constricted to a neck with a broad nuchal collar; petiolar peduncle slender.

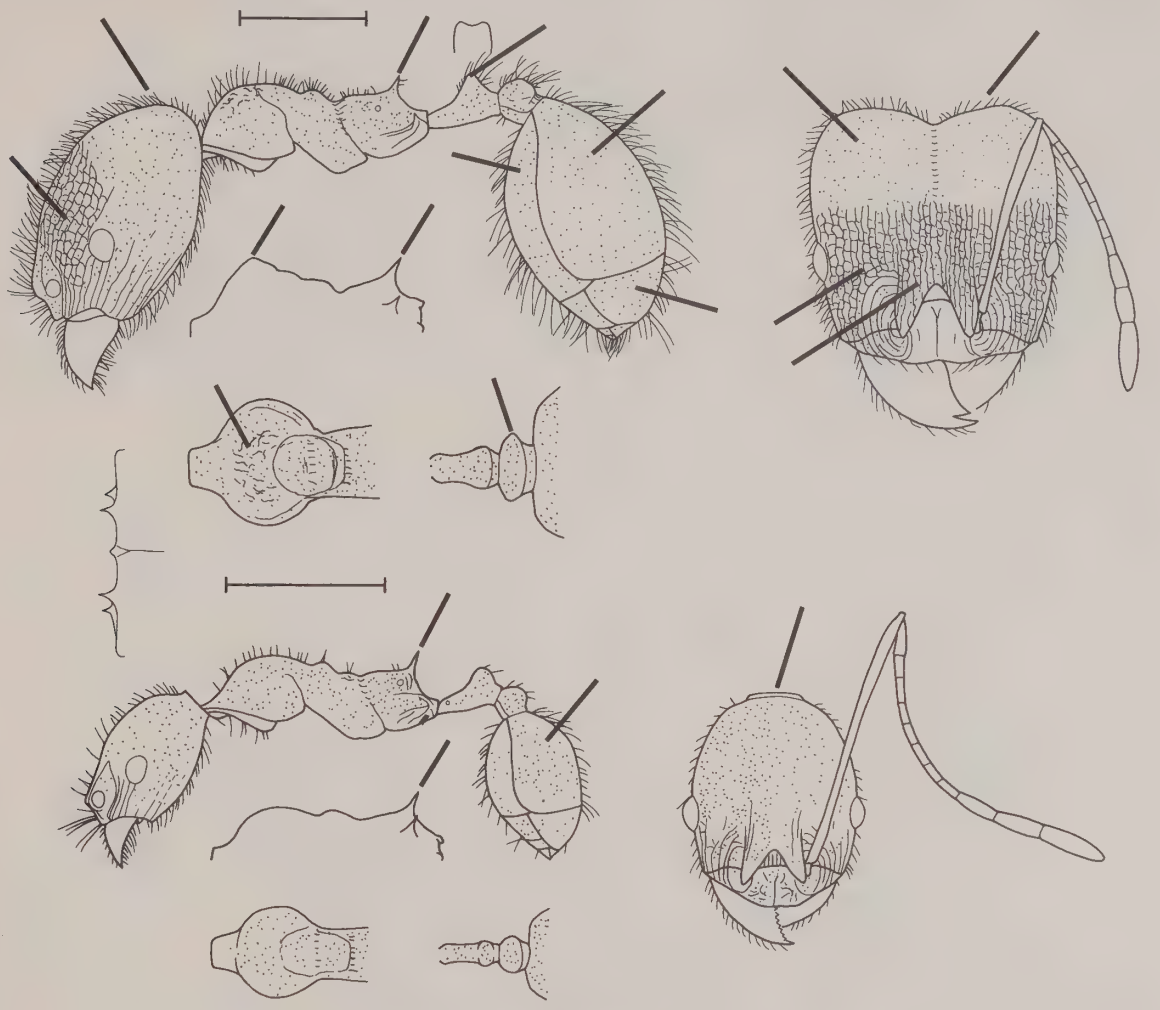
MEASUREMENTS (mm) Holotype major: HW 1.68, HL 1.80, SL 1.00, EL 0.22, PW 0.80.
Paratype minor: HW 0.56, HL 0.82, SL 1.12, EL 0.14, PW 0.44.

COLOR Major: head dark reddish brown, body dark and in some places blackish brown.
Minor: head, mesosoma, and petiolar peduncle medium brown; gaster and rest of waist light brown; appendages light brown.

RANGE Known only from the type locality.

BIOLOGY The type colony was found in terra firme rainforest, nesting in an epiphyte mass on a large fallen tree. A second colony was discovered at the same locality and habitat, nesting beneath the bark of a fallen log at the edge of a tree gap.

FIGURE Upper: major, with minor compared with syntype minor (San Jose Purua, Michoacán, Mexico; R. J. Hamton). Lower: syntype, minor (Cuernavaca, Morelos, Mexico; W. M. Wheeler). Scale bars = 1 mm.



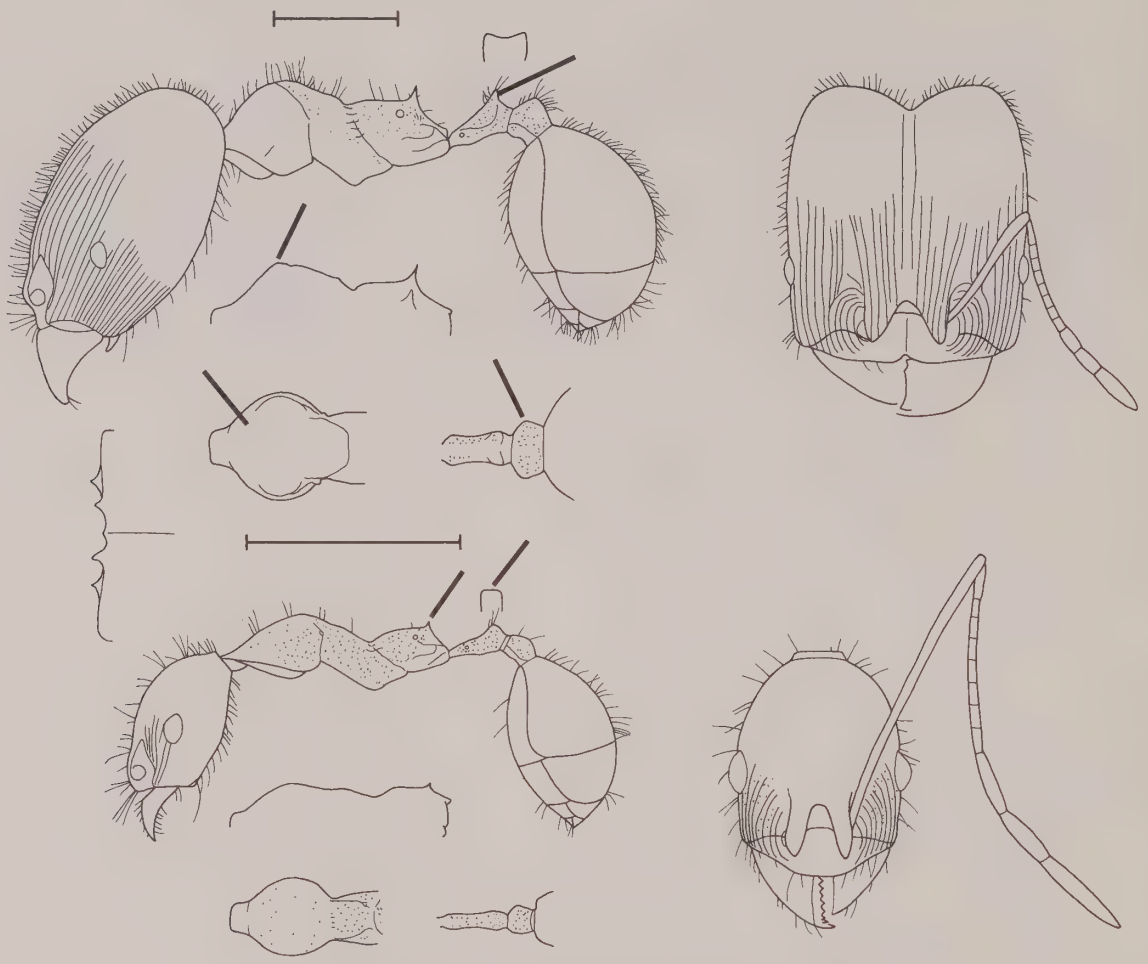
Pheidole tolteca Forel

Pheidole tolteca Forel 1901d: 133.

TYPES Mus. Hist. Nat. Genève; Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the Toltec, Amerindian ruling people of central Mexico from 10th to 12th century A.D.
DIAGNOSIS A large, completely foveolate and opaque member of the *fallax* group, somewhat similar to *aequiseta* and *gouldi*.
Major: antennal scape just attains occipital corner; pilosity of head and mesosoma short, erect to suberect, and mostly of same length; propodeal spines long and relatively thin; rugoreticulum forms a band from eye to eye, anterior to near anterior border of head, and onto frontal lobes; center of pronotal dorsum with broken, scattered rugulae; humerus prominent, subangular; postpetiole from above elliptical.
Minor: body completely foveolate; propodeal spines one-third as long as the basal propodeal face anterior to them, and thin; occiput narrow and with nuchal collar.
MEASUREMENTS (mm) Major (Michoacán, Mexico): HW 1.72, HL 1.82, SL 1.44, EL 0.30, PW 0.88.
Syntype minor: HW 0.86, HL 1.06, SL 1.40, EL 0.22, PW 0.62.
COLOR Major: head and appendages light reddish brown, rest of body medium reddish brown.
Minor: concolorous medium dull brown except for anterior rim of head capsule and mandibles, which are yellowish brown.
RANGE Recorded from Cuernavaca, Morelos (type locality); Cuautla, Morelos; San Jose Purua, Michoacán (Robert J. Hamton); and 95 km north of Acapulco, Guerrero.
BIOLOGY The Cuautla workers were in a house, and those collected in San Jose Purua, Michoacán, were collected in tropical scrub.

Compare with *astur, oxyops, praeusta*

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: campus of Universidade Federale de Mato Grosso, Cuiabá, Mato Grosso (James Trager). Scale bars = 1 mm.



Pheidole trageri **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the myrmecologist and collector of the type series James Trager.

DIAGNOSIS A member of a complex of *Pheidole* species with giant majors having short bristly hair, in the *fallax* group and comprising *astur, oxyops, praeusta,* and *trageri*. *P. trageri* is distinguished among them by the following combination of traits.

Major: lacking rugoreticulum on head; one carinula on each side of the dorsal cephalic midline reaches the occiput but otherwise nearly the entire posterior half of the dorsal surface of the head capsule is smooth and shiny; pronotum faintly bilobous in dorsal-oblique view; propodeal spines stout, long, and vertical to the basal propodeal face; postpetiolar node seen from above trapezoidal; pronotum entirely smooth and shiny.

Minor: occiput narrowed somewhat, with nuchal collar; propodeal spine reduced to a denticle; entire mesosoma, including pronotum, foveolate and opaque.

MEASUREMENTS (mm) Holotype major: HW 2.10, HL 2.44, SL 1.04, EL 0.26, PW 0.92.

Paratype minor: HW 0.62, HL 0.80, SL 0.94, EL 0.16, PW 0.44.

COLOR Major: light reddish yellow (light "orange"), color deepening from middle of head forward, reaching light reddish brown on mandibles.

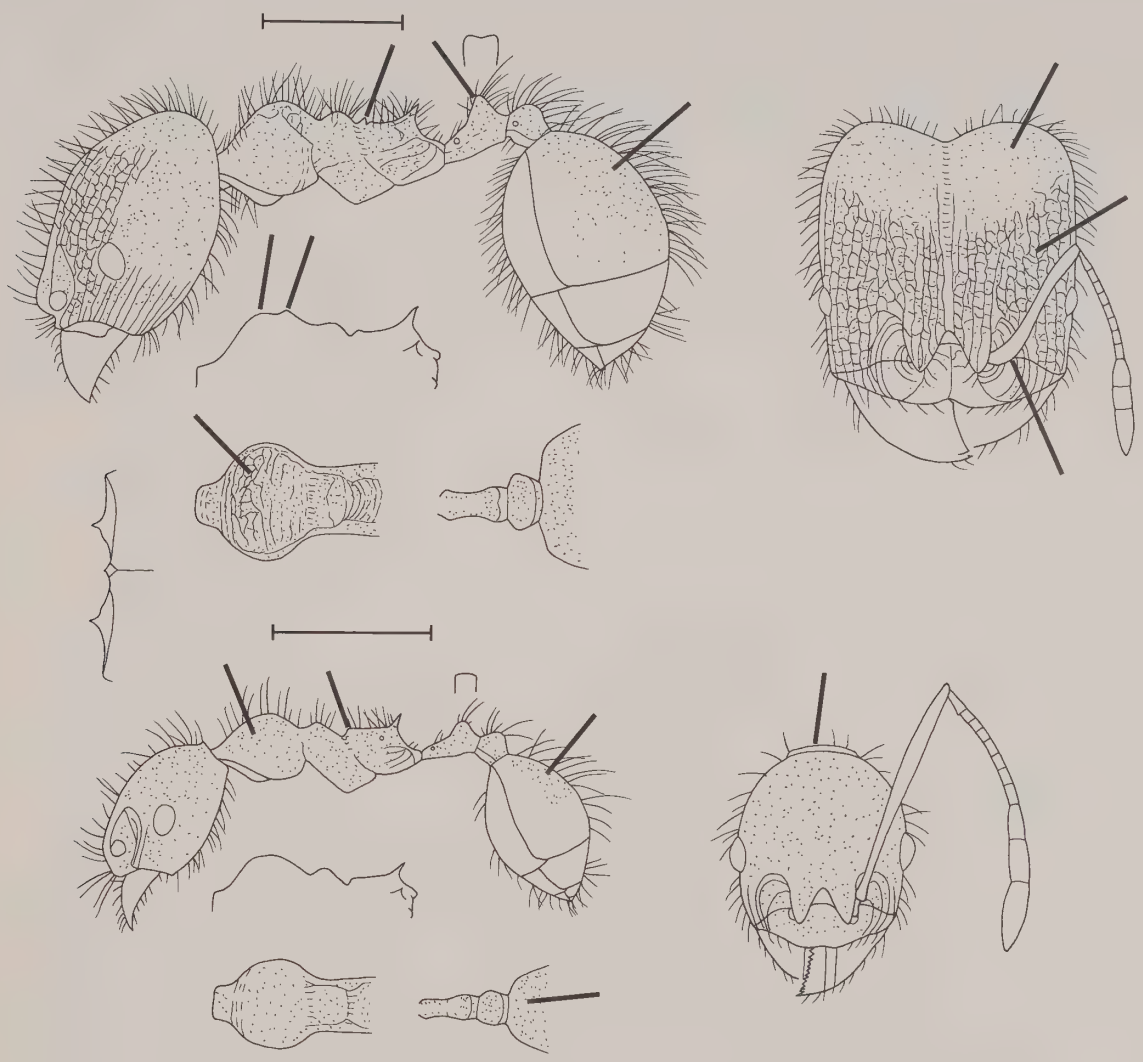
Minor: concolorous yellow.

RANGE Known only from the type series.

BIOLOGY Unknown.

Compare with *fallax, jelskii, obscurithorax, puttemansi, roushae*

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: Mpio. Livramento, Mato Grosso (James C. Trager). Scale bars = 1 mm.



Pheidole valens **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *valens,* strong, vigorous.

DIAGNOSIS A member of the *fallax* group with similarities to *fallax, jelskii, obscurithorax, puttemansi,* and *roushae,* distinguished as follows.

Major: head quadrate; almost all of anterior two-thirds of dorsal surface of head (except frontal triangle, antennal fossae, and clypeus) rugoreticulate, and posterior third foveolate; anterior half of pronotal dorsum rugoreticulate; antennal scape near base slightly broader than near tip; pronotum weakly bilobous in dorsal-oblique view; metanotum convex in side view; petiole thick in side view, but the apex of its node tapering almost to a point; median strip of entire first gastral tergite shagreened and opaque.

Minor: all of head, mesosoma, and waist foveolate and opaque; anterior half of median strip shagreened.

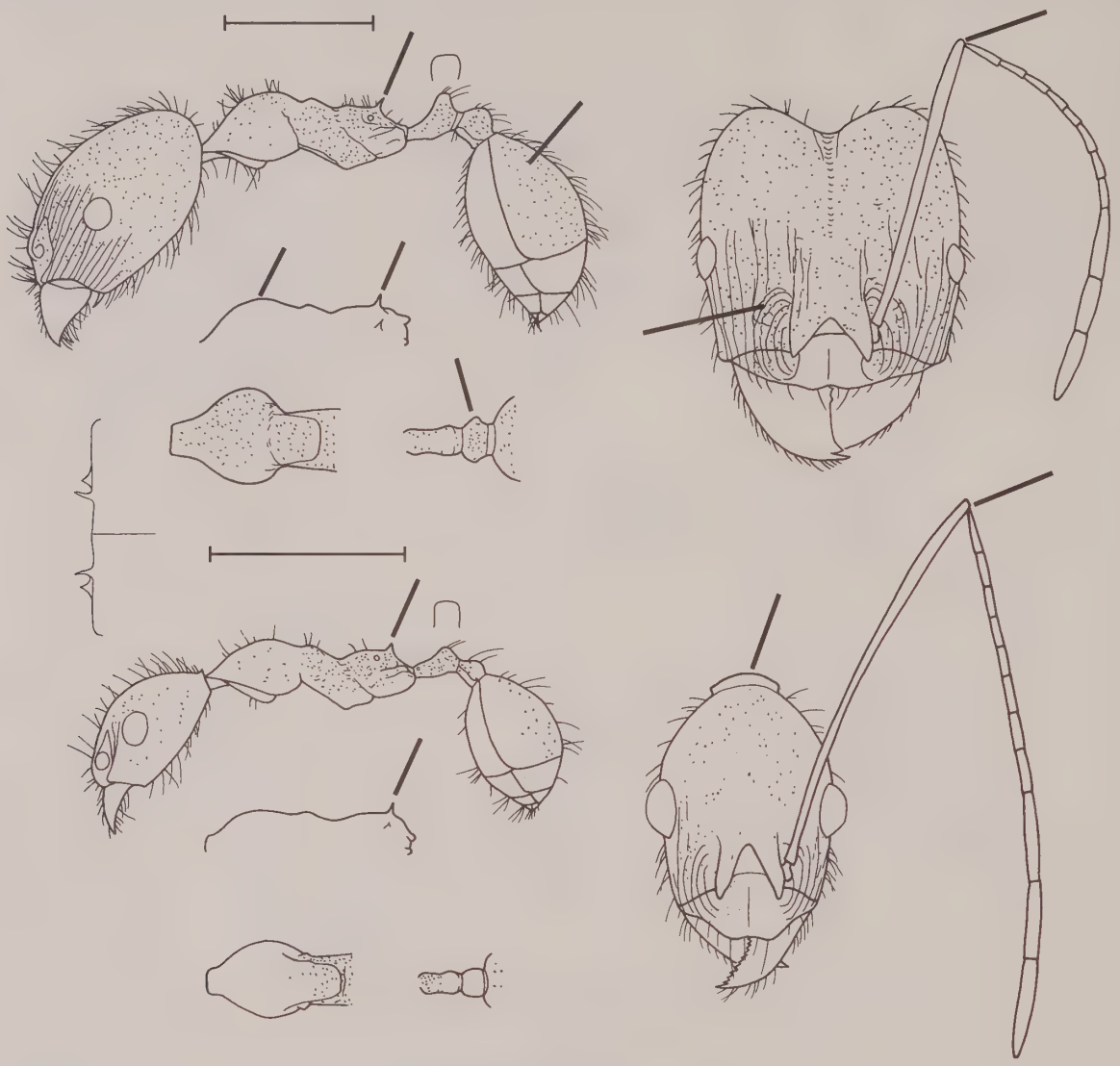
MEASUREMENTS (mm) Holotype major: HW 1.70, HL 1.80, SL 1.02, EL 0.26, PW 0.92.
Paratype minor: HW 0.66, HL 0.84, SL 1.04, EL 0.18, PW 0.54.

COLOR Major: head, mesosoma, and petiole medium reddish brown; postpetiole and gaster dark reddish brown.
Minor: body medium reddish brown except for gaster, which is dark reddish brown; appendages light reddish brown.

RANGE Known only from the type locality.

BIOLOGY The type colony was found in a soil nest whose entrance hole was surrounded by pebbles, in a cerrado-like secondary thicket.

FIGURE Upper: major. Lower: minor. CALIFORNIA: La Jolla. Scale bars = 1 mm.



Pheidole vistana Forel

Pheidole longipes var. *vistana* Forel 1914d: 272, raised to species level by D. R. Smith 1979. Syn.: *Pheidole grallipes* Wheeler 1916g: 40, replacement name for *susannae longipes* Pergande 1896: 885, which is a junior secondary homonym of *longipes* Latreille 1802a: 233, synonymy by Gregg 1959: 22.

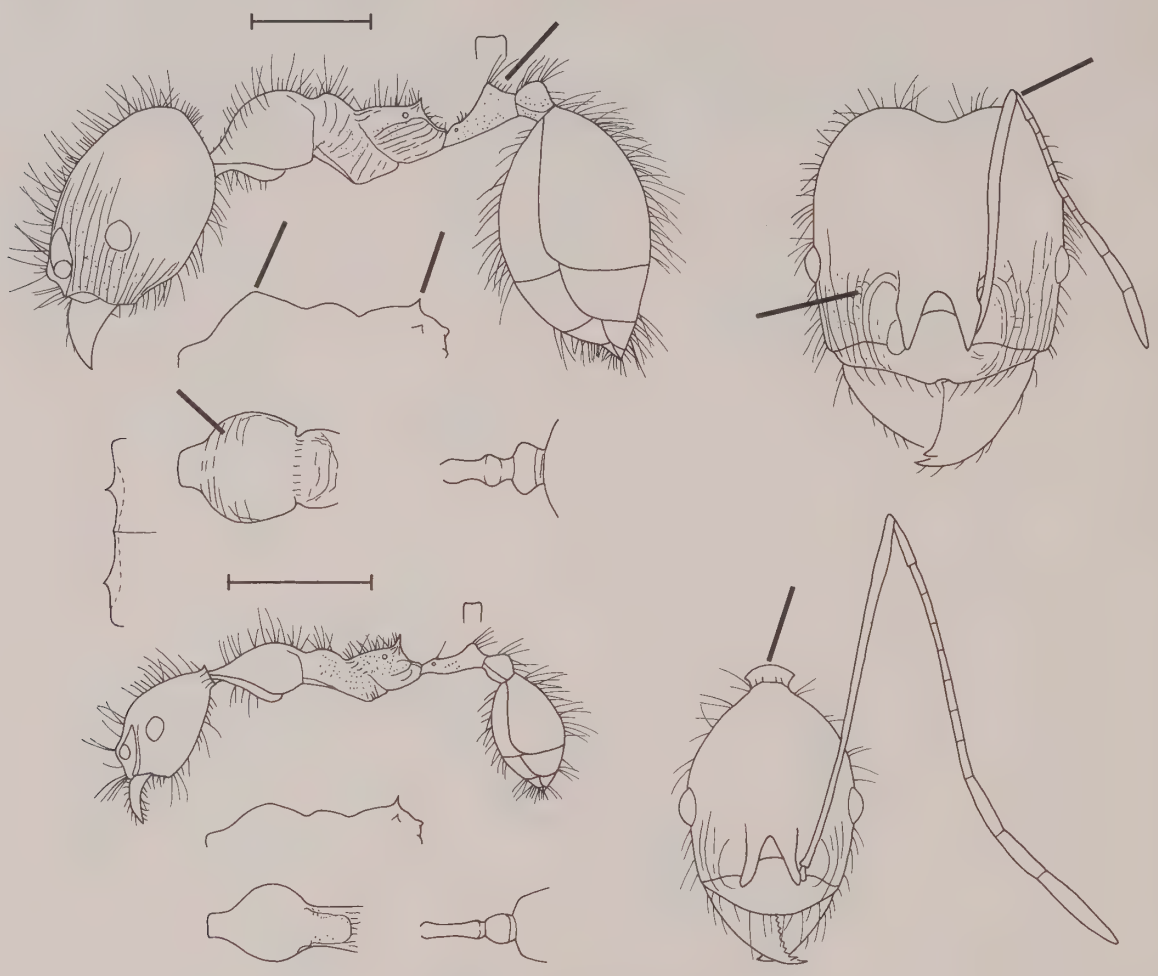
TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY Unknown.
DIAGNOSIS Similar to species listed in heading above, differing from these and other members of the *fallax* group as follows.
Major: yellow; slender; with extremely long scapes, exceeding the occipital corners by a third their own length; all of head, mesosoma, and waist foveolate and opaque; all of first gastral tergite shagreened and opaque; rugoreticulum present just laterad to each antennal fossa.
Minor: yellow; slender; extremely long antennal scapes, exceeding the occipital border by more than half their own length; occiput narrow, with nuchal collar; all of head, mesosoma, and waist foveolate and opaque; all of central strip of first gastral tergite shagreened and opaque.
MEASUREMENTS (mm) Major (La Jolla, California): HW 1.30, HL 1.48, SL 1.54, EL 0.26, PW 0.60.
Minor (La Jolla, California): HW 0.64, HL 0.96, SL 1.52, EL 0.20, PW 0.44.
COLOR Major: concolorous dark yellow.
Minor: concolorous medium yellow.

RANGE Southern California and adjacent northern Mexico. There is a single series in the Museum of Comparative Zoology from Tucson, Arizona.

BIOLOGY In Deep Canyon, G. C. and J. N. Wheeler (1973e) found two nests of this distinctive species under palo verde *(Cercidium floridum)* trees, in nests ringed by craters of sand and with very large diameters. The workers are active at dusk but not during the day. They feed exclusively on insects, attacking larger prey in groups and spread-eagling their legs to render them helpless. The workers are also very efficient at forming gangs to transport large prey to the nests. Wheeler and Wheeler called them "ghost ants," because in dim light the legs of foraging minors could not be seen, and the bodies appeared to float above the surface. The Wheelers also reported an instance of *vistana* workers invading a house at Deep Canyon.

Compare with species listed
in the Diagnosis below

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Rio Madeira, Rondônia (William M. Mann). Scale bars = 1 mm.

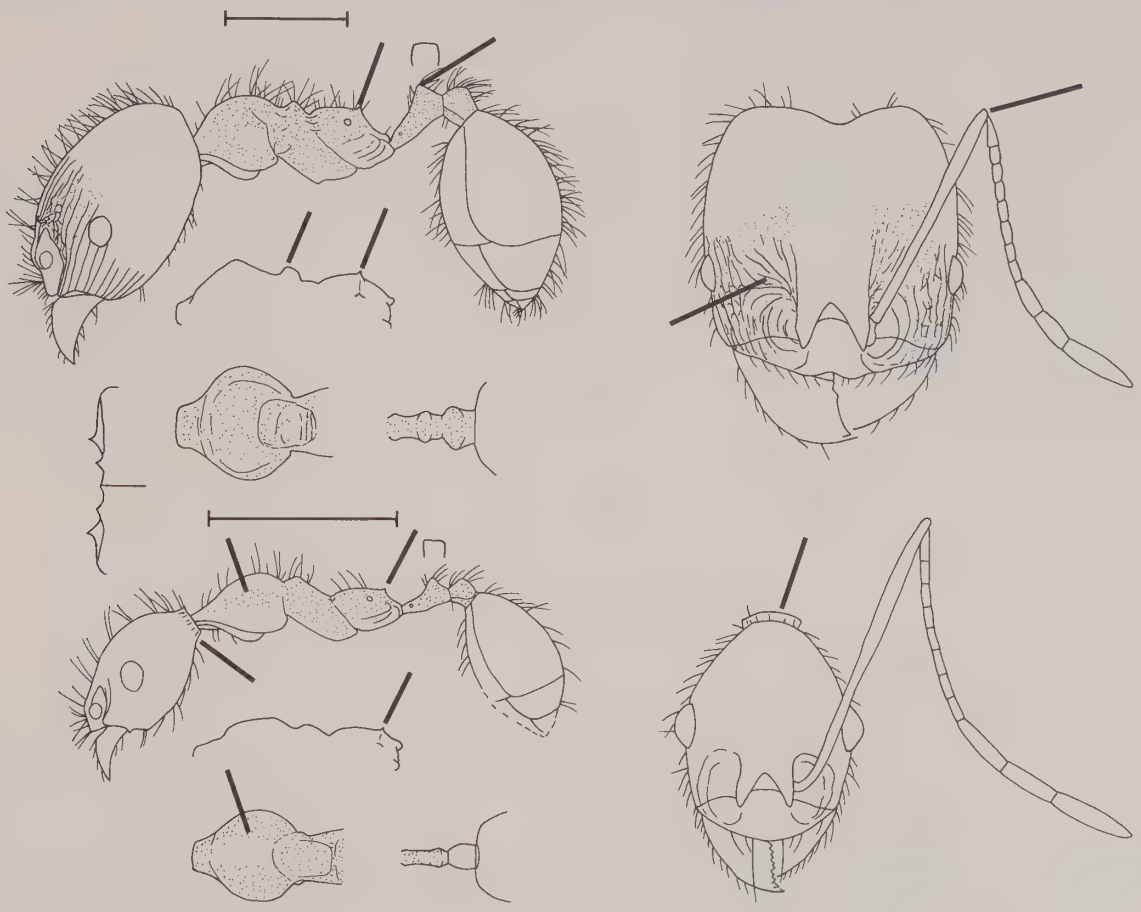


Pheidole wallacei Mann

Pheidole wallacei Mann 1916: 437.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Eponymous.
DIAGNOSIS A large, relatively thin and long-legged member of the "*jujuyensis* complex" of the larger *fallax* group, comprising *araneoides, chocoensis, cuevasi, jujuyensis, kugleri, leonina, leptina, lucretii, lupus, paraensis, punctithorax, tijucana, wallacei,* and *wolfringi*. *P. wallacei* is distinguished by the following combination of traits.
Major: scape surpasses antennal corner by about its own greatest width; carinulae reach midpoint of head capsule, and very small rugoreticular patches present laterad to circular carinulae of antennal fossae; humerus subangulate in dorsal-oblique view; propodeal spine small, equilateral in shape in side view.
Minor: occiput drawn out into a neck with a nuchal collar; body almost completely smooth and shiny; propodeal spine well-developed and relatively thin.
MEASUREMENTS (mm) Lectotype major: HW 1.74, HL 1.88, SL 1.60, EL 0.26, PW 0.96.
Paralectotype minor: HW 0.74, HL 1.26, SL 2.04, EL 0.24, PW 0.58.
COLOR Major: concolorous reddish yellow.
Minor: concolorous medium yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: São Paulo. Scale bars = 1 mm.

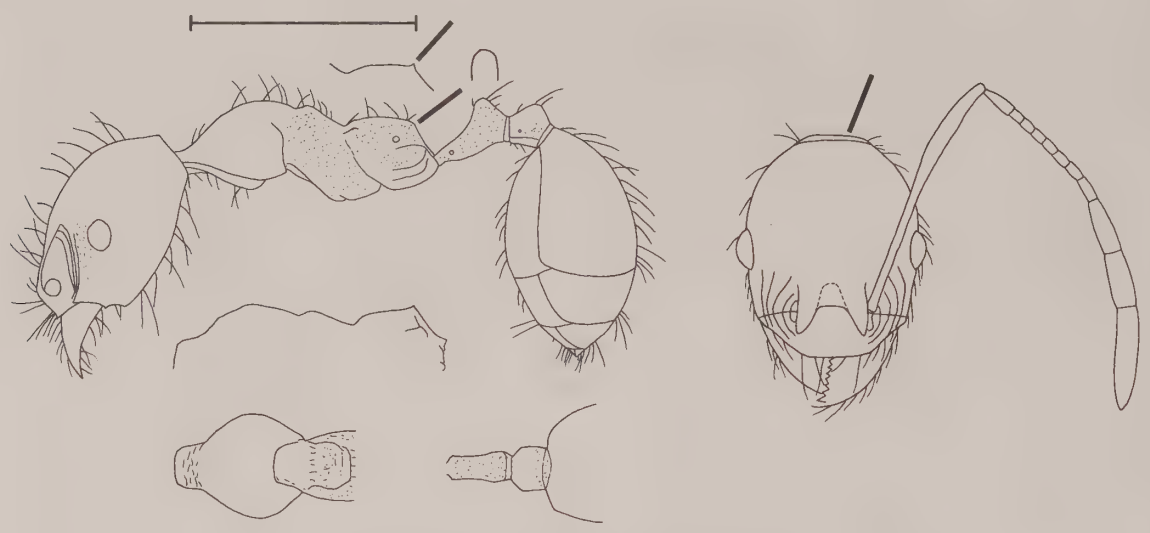


Pheidole wolfringi Forel

Pheidole wolfringi Forel 1908h: 374. Raised to species level in this monograph: *durionei*.

TYPES Mus. His. Nat. Genève.
ETYMOLOGY Eponymous.
DIAGNOSIS A member of the "*jujuyensis* complex" of the larger *fallax* group, comprising *araneoides, cuevasi, durionei, jujuyensis, kugleri, leonina, leptina, lucretii, lupus, paraensis, punctithorax, tijucana, wallacei,* and *wolfringi*.
P. wolfringi is distinguished as follows.
Major: antennal scape exceeds occipital corner by 2× its own maximum width; posterior two-fifths of dorsal head surface and all of posterior four-fifths of side of head smooth and shiny; carinulae originating laterad to frontal carinae fan outward; rugoreticulum limited on each side of head to small patch near antennal fossa; mesonotal convexity in dorsal-oblique view semicircular; propodeal spines reduced to denticles; pronotum and all of waist foveolate; petiolar node in side view with angulate apex.
Minor: propodeal spines reduced to denticles; pronotum mostly foveolate; occiput constricted into neck, with nuchal collar.
MEASUREMENTS (mm) Lectotype major: HW 1.20, HL 1.24, SL 1.12, EL 0.22, PW 0.66.
Paralectotype minor: HW 0.54, HL 0.76, SL 1.10, EL 0.18, PW 0.42.
COLOR Major: concolorous light brown.
Minor: body light brown, appendages a shade lighter.
RANGE Kempf (1972b) records *wolfringi* from Rio de Janeiro and São Paulo.
BIOLOGY Unknown.

FIGURE Holotype, minor, with paratype propodeum depicted above. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios (Stefan Cover and John E. Tobin). Scale bar = 1 mm.



Pheidole xanthogaster **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *xanthogaster,* yellow stomach, referring to the gaster.

DIAGNOSIS A species tentatively placed in the *fallax* group, of uncertain affinities, known only from the minor caste, and recognized formally here because of its strikingly distinctive bicolored body. It is further distinguished by the reduction of the propodeal spines to denticles and narrow occiput with a thin nuchal collar.

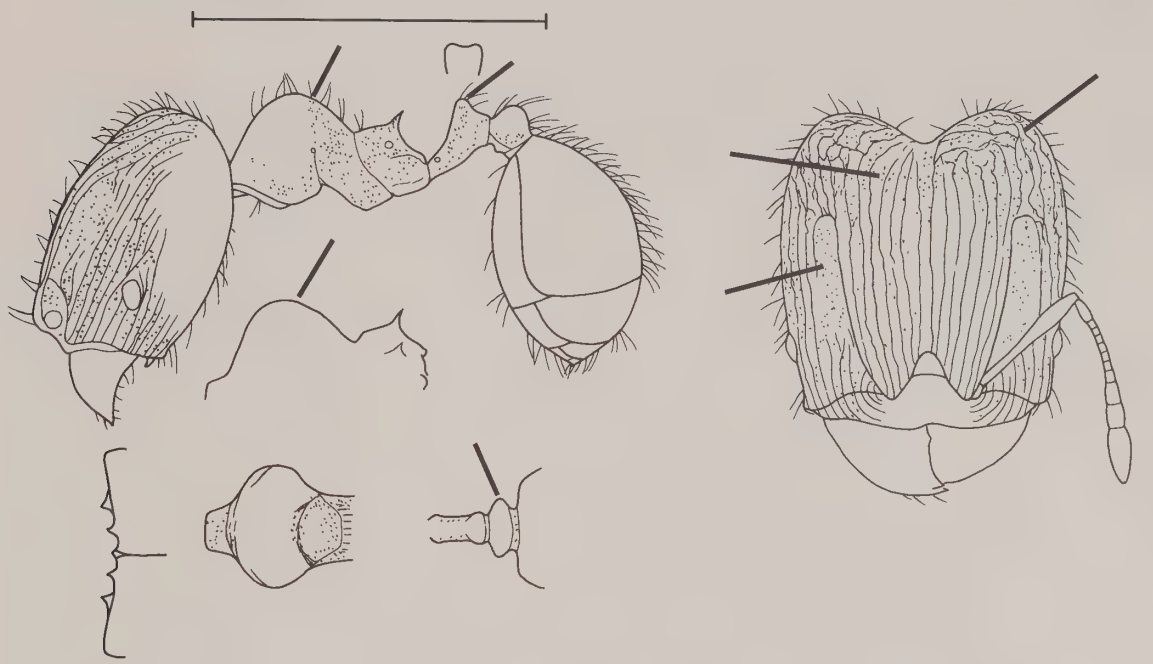
MEASUREMENTS (mm) Holotype minor: HW 0.66, HL 0.80, SL 0.96, EL 0.14, PW 0.44.

COLOR Minor: bicolored, with head, mesosoma, and waist light yellowish brown, and gaster clear medium yellow; mandibles and tarsi clear medium yellow; antennae and other leg parts yellowish brown.

RANGE Known only from the type locality.

BIOLOGY The four type minors were collected from the floor of forest transitional between terra firme of higher ground and seasonally flooded forest.

FIGURE Holotype, major. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios (Stefan Cover and John E. Tobin). (The minor is nearly identical to that of *P. sospes,* q.v.). Scale bar = 1 mm.

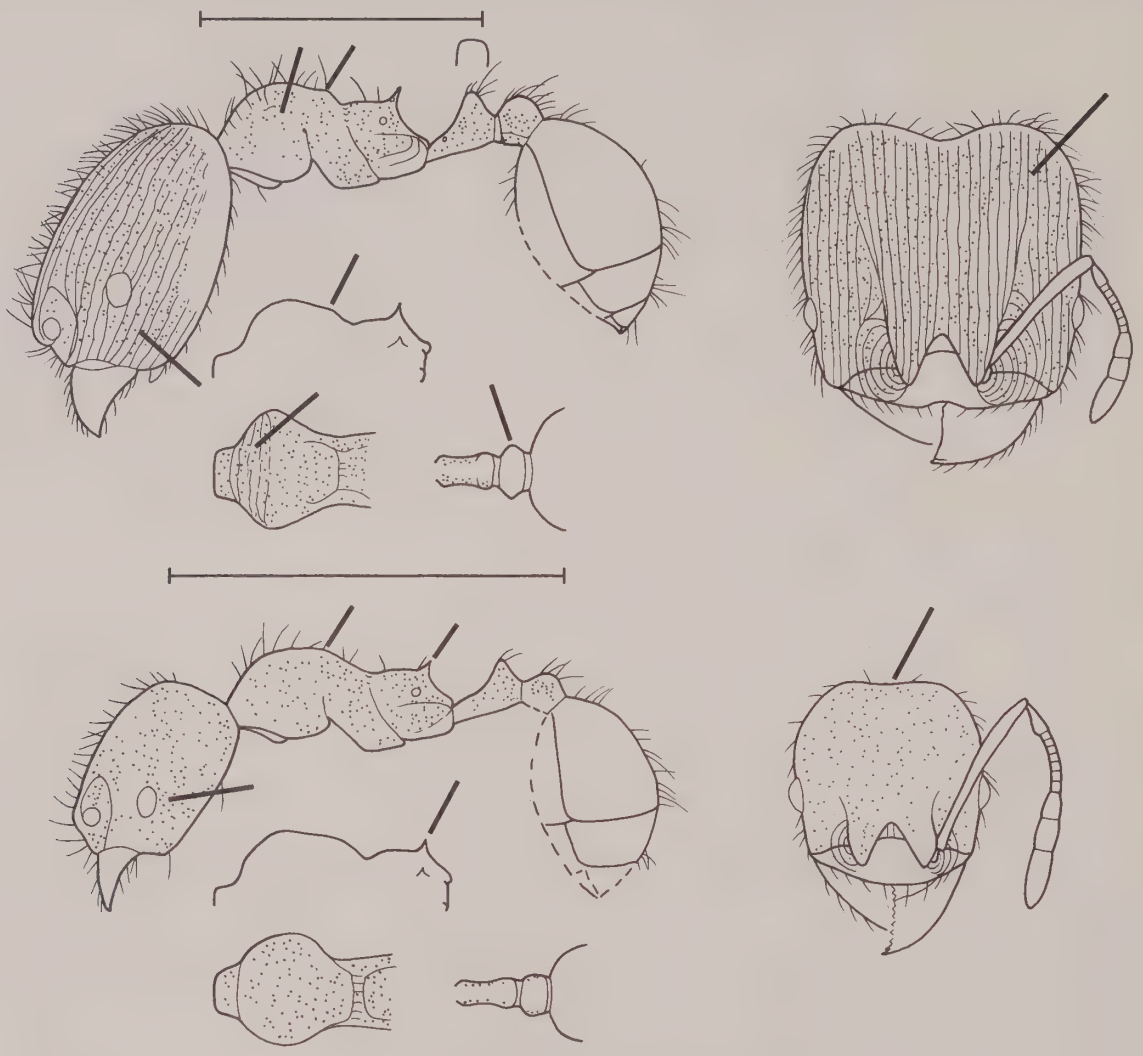


Pheidole ademonia **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *ademonia,* troubled, distressed.
DIAGNOSIS A small yellow member of the *flavens* group, similar to the species listed in the heading above, distinguished by the following combination of traits.
Major: antennal scrobe present, its surface weakly foveolate; occiput rugoreticulate, with remainder of dorsal head surface longitudinally carinulate; carinulae near the cephalic midline curving inward; promesonotal dorsal profile forms a single high, semicircular curve.
Minor: almost identical to that of *sospes* (see illustration of that species).
MEASUREMENTS (mm) Holotype major: HW 0.74, HL 0.80, SL 0.36, EL 0.06, PW 0.34.
Paratype minor: HW 0.38, HL 0.40, SL 0.34, EL 0.06, PW 0.24.
COLOR Major: concolorous medium reddish yellow.
Minor: concolorous plain medium yellow.
RANGE Known from the type locality and from several series collected at the Yasuni National Park, Ecuador.
BIOLOGY Two series were collected at the type locality in terra firme forest. One was a small group of ants found beneath the bark of a rotten log, the other several strays in soil (Stefan Cover, unpublished notes).

Compare with *atticola, dinophila, hazenae, lucaris, ulothrix*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ARGENTINA: Estación Sosa, Entre Rios. Scale bars = 1 mm.

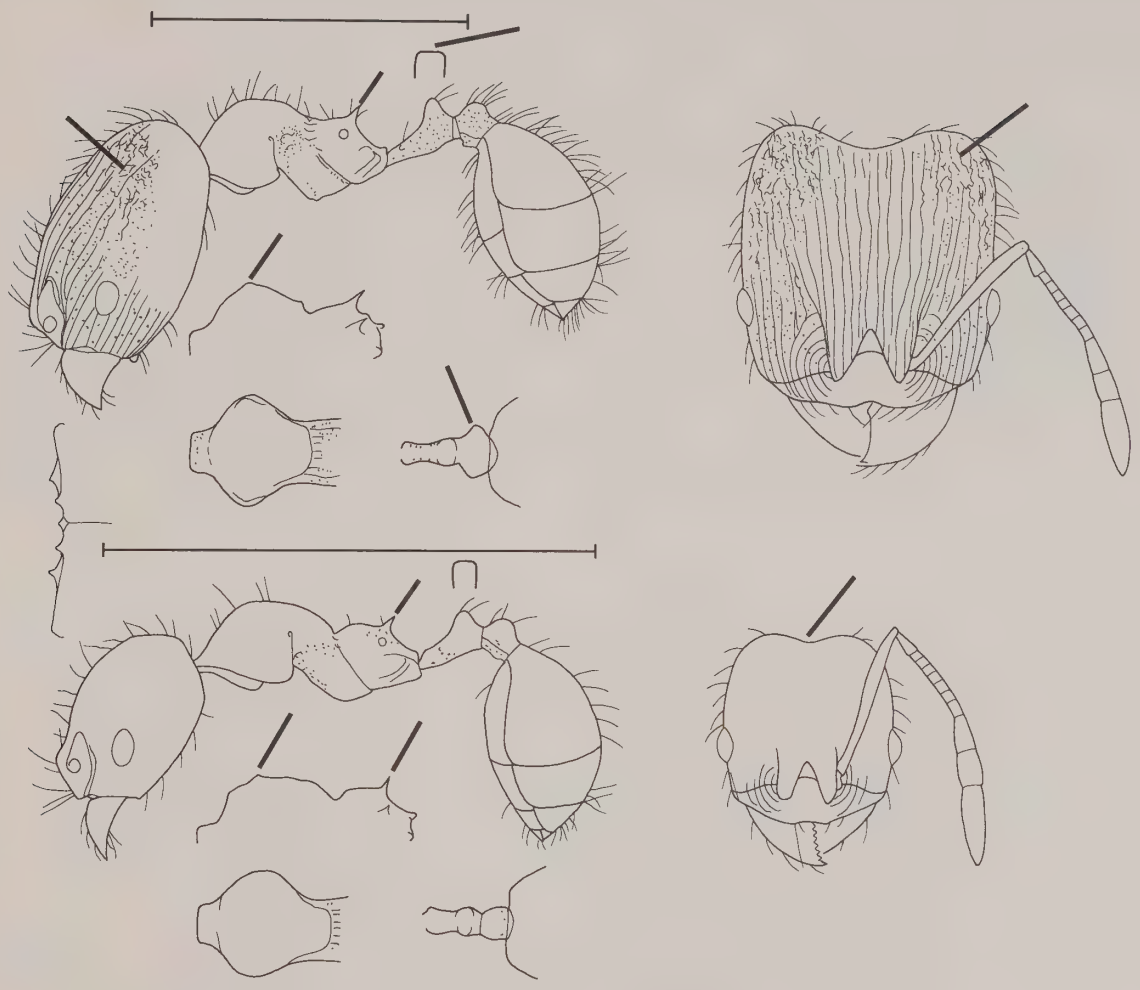


Pheidole alacris Santschi, **new status**

Pheidole flavens st. *alacris* Santschi 1923d: 61. Syn.: *Pheidole flavens* var. *mediorubra* Santschi 1933f: 107, n. syn.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY L *alacris,* active, eager.
DIAGNOSIS Similar in various traits to species listed in the heading above, distinguished as follows.
Major: brown, with yellow legs; entire dorsum of head except for frontal triangle and midclypeus carinulate; anterior third of pronotal dorsum covered by broken transverse carinulae; all of dorsal surface of head and all of mesosoma foveolate; in side view mesonotal convexity present, although very low; postpetiole seen from above elliptical.
Minor: eye set well forward on head; propodeal spine equilaterally triangular; all of head and mesosoma foveolate; occiput narrowed somewhat, its margin straight; nuchal collar absent.
MEASUREMENTS (mm) Lectotype major: HW 0.94, HL 0.96, SL 0.52, EL 0.12, PW 0.50.
Paralectotype minor: HW 0.42, HL 0.48, SL 0.42, EL 0.08, PW 0.28.
COLOR Major: body and mandibles medium brown; other appendages dark yellow.
Minor: concolorous light brown.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: Pueblo Nuevo, near Tetzonapa, Veracruz (E. O. Wilson). Scale bars = 1 mm.



Pheidole albipes **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *albipes,* white-footed.

DIAGNOSIS A small, strikingly colored species of the *flavens* group, similar in various traits to *alticola, chalca, ebenina, euryscopa, hedlundorum, lustrata, monteverdensis, palenquensis,* and *servilia,* differing as follows.

Major: reddish brown with strongly contrasting pale yellow tibiae and tarsi, and head bicolorous; region between eye and occipital border irregularly rugoreticulate, occipital margins and center of clypeus smooth and shiny, and rest of dorsal surface of head carinulate; almost all of mesosoma smooth and shiny; humerus subangulate in dorsal-oblique view; postpetiole diamond-shaped from above.

Minor: almost all of head and body smooth and shiny; occiput broad and strongly concave; humerus subdenticulate in dorsal-oblique view.

MEASUREMENTS (mm) Holotype major: HW 0.60, HL 0.64, SL 0.38, EL 0.10, PW 0.34.
Paratype minor: HW 0.38, HL 0.40, SL 0.36, EL 0.06, PW 0.24.

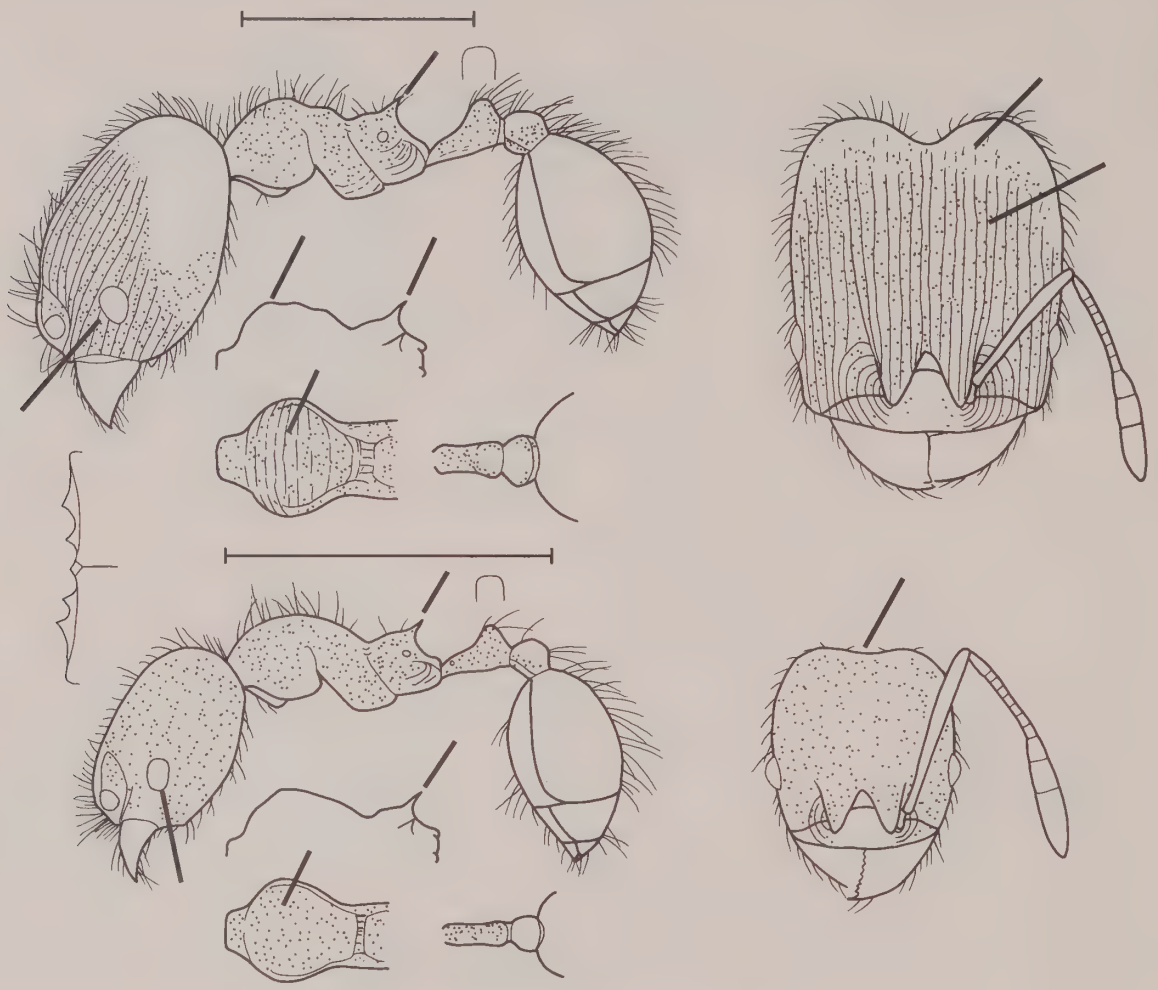
COLOR Major: body, coxae, and femora medium reddish brown; head anterior to eyes yellow; antennae, tibiae, and tarsi pale yellow. Minor: head and body medium brown; coxae and femora light brown; antennae, tibiae, and tarsi very pale yellow, almost white.

RANGE Southern Mexico: known from several lowland forested localities in Veracruz, and from forest 7 km south of Valle Nacional, Oaxaca, at 450 m.

BIOLOGY At the type locality, in degraded lowland forest, I found two colonies nesting in small rotting tree branches in the ground leaf litter, and another colony under the bark of a large rotten log.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype minor. COLOMBIA: Parque Nacional Cuevas de las Guacheros, 10 km southeast of Palestina, 1900–2000 m (Charles Kugler and J. Hahn). Scale bars = 1 mm.



Pheidole alticola **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *alticola,* dweller of high places, alluding to the type locality.

DIAGNOSIS A medium-sized, brown member of the *flavens* group with contrasting yellow legs. Very similar to *euryscopa,* which occurs at the same locality, and especially in its large, forward-placed eye and curved, backward-directed propodeal spines, but differing in the **major** in important details of pronotal form and sculpturing, extent of smooth area at and forward of the occiput, and in color.

See also the less similar *albipes, ebenina, hazenae, hedlundorum, lustrata, monteverdensis, palenquensis,* and *servilia*.

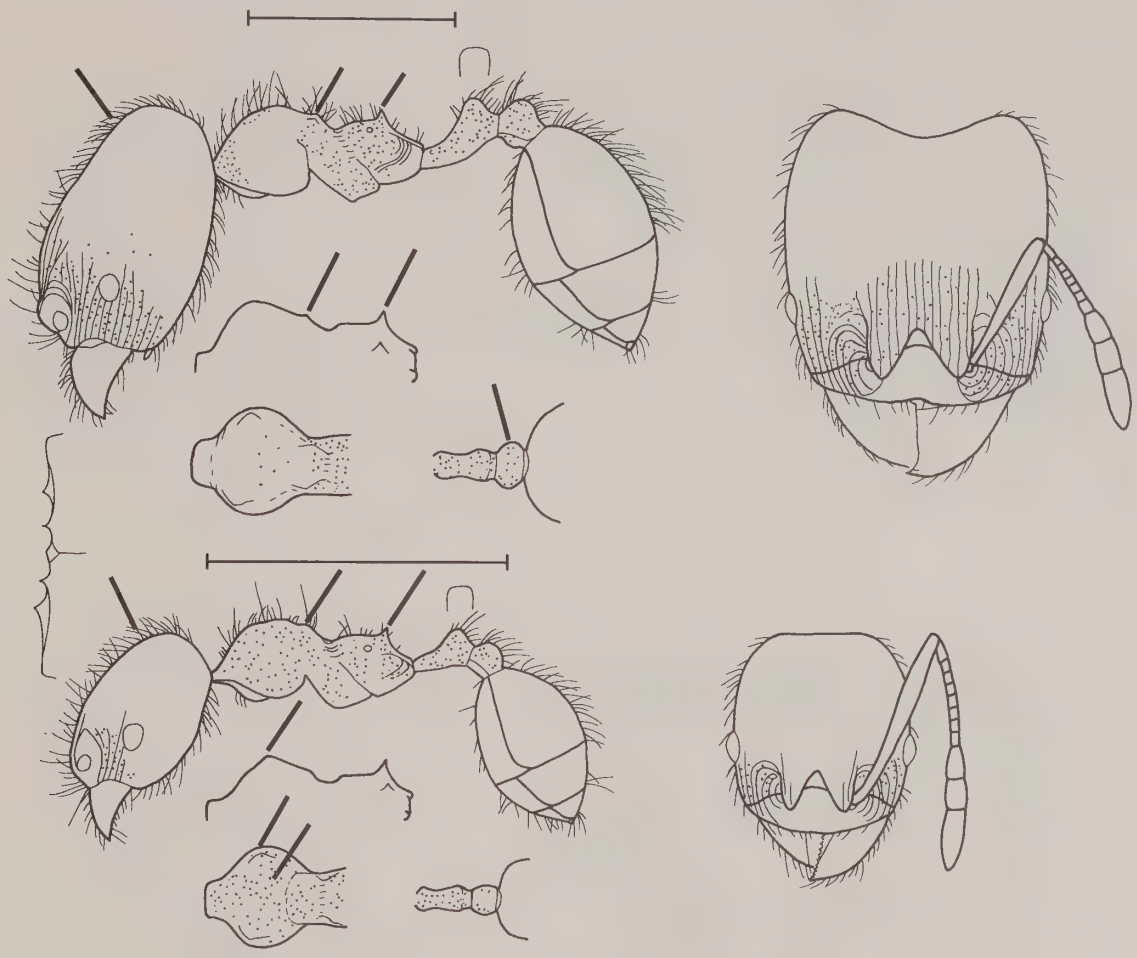
MEASUREMENTS (mm) Holotype major: HW 0.84, HL 1.00, SL 0.48, EL 0.14, PW 0.42.
Paratype minor: HW 0.52, HL 0.58, SL 0.50, EL 0.10, PW 0.34.

COLOR Major and minor: body medium brown, appendages dark yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Rio Peñas Blancas, Alajuela, 10°19′N 84°42′W, 800 m (J. T. Longino). Scale bars = 1 mm.



Pheidole amabilis **new species**

TYPES INBio.

ETYMOLOGY L *amabilis,* lovely.

DIAGNOSIS A medium-sized, concolorous yellow species whose **major** is distinguished by the slightly concave profile of the posterior half of the head capsule; also possessing a carpet of dense, evenly short, forward-projecting, subdecumbent (45°-angled from surface) hairs on the posterior half of the head and occiput; weak but distinct mesonotal convexity; and short, nearly vertical propodeal spines.

Similar to *angulifera, boliviana, crinita, melastomae, mixteca, scitula, terresi,* and *tysoni,* but readily distinguished by the above traits as well as by various differences in sculpture and color.

MEASUREMENTS (mm) Holotype major: HW 0.94, HL 1.14, SL 0.52, EL 0.14, PW 0.48.

Paratype minor: HW 0.60, HL 0.66, SL 0.60, EL 0.14, PW 0.36.

COLOR Major: concolorous medium yellow.

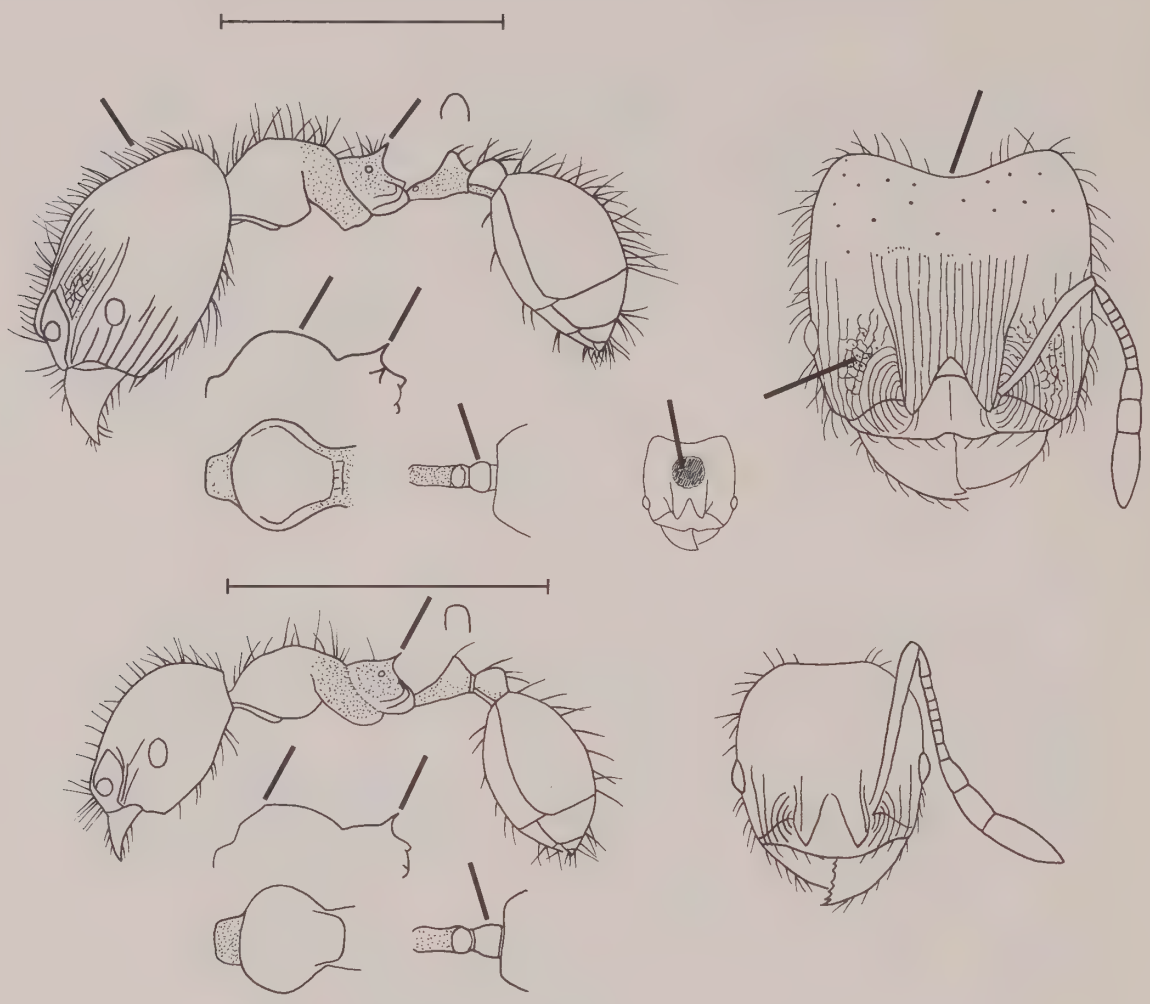
Minor: gaster dark yellow, rest of body medium yellow.

RANGE Reported by John T. Longino (1997) from the Atlantic slope of Costa Rica to 1100 m.

BIOLOGY According to Longino (1997), *amabilis* occurs in wet forest. Nests have been found in *Cecropia* sapling internodes, in foliar pouches of a myrmecophytic melastome, and in a dead stick in leaf litter. The colony in the dead stick was separated from a colony of *Pheidole scrobifera* by a plug of woody frass; fighting between the two species ensued when the plug was removed.

Compare with *flavifrons,* and other species listed in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios, 200 m (Stefan Cover and John E. Tobin). Scale bars = 1 mm.



Pheidole amazonica **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *amazonica,* a reference to the geographical region of origin.

DIAGNOSIS A small, brown member of the *flavens* group most similar to *flavifrons* but also in various traits to *arhuaca, nitidicollis,* and *tenerescens,* differing from those species and other members of the *flavens* group by the following combination of traits.

Major: dorsal half of the posterior head surface in profile flat; occipital margin in full-face view deeply and broadly concave; propodeal spines directed to the rear, not vertical to the basal propodeal face; an indistinct, circular brown spot present on vertex; a patch of rugoreticulum present laterad to each antennal fossa.

Minor: propodeal spines directed backward; humerus in dorsal-oblique view denticulate; occiput narrowed but lacking a nuchal collar; postpetiole from above bell-shaped.

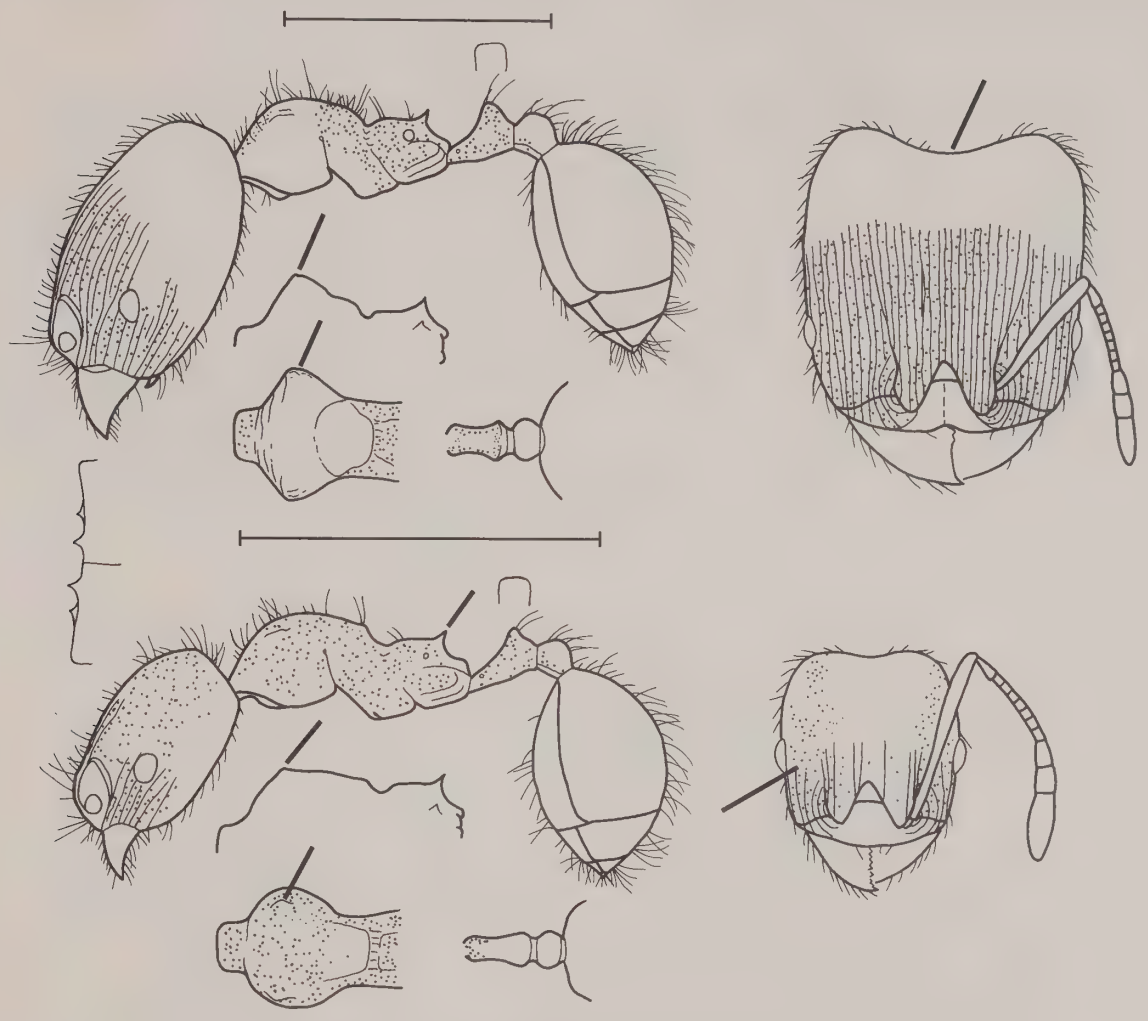
MEASUREMENTS (mm) Holotype major: HW 0.78, HL 0.78, SL 0.40, EL 0.08, PW 0.38.
Paratype minor: HW 0.42, HL 0.44, SL 0.38, EL 0.08, PW 0.26.

COLOR Major: body medium brown, with dark brown circular spot on vertex, and anterior one-fourth of head capsule dark yellowish brown; appendages dark yellowish brown.
Minor: body mostly medium brown, with sides of pronotum, nodes of petiole and postpetiole, and first gastral tergite light brown; appendages also light brown.

RANGE Known from the type locality and near Tena, Napo, Ecuador, 600 m.

BIOLOGY At the type locality in Peru, Stefan Cover (unpublished collection notes) found *amazonica* to be apparently the most abundant of all *Pheidole* species, ranging from terra firme forest into seasonally flooded forest and nesting in rotten sticks or branches on the forest floor. Colonies contained several hundred workers and a single queen. No seed caches were found in any of the 21 nests dissected.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: 4 km south of San Vito, Puntarenas, 8°47′N 82°58′W, 1200 m (J. T. Longino). Scale bars = 1 mm.



Pheidole angulifera **new species**

TYPES INBio.

ETYMOLOGY L *angulifera,* angle-bearer, referring to the prominently angulate humerus.

DIAGNOSIS A medium-sized, bicolorous member of the *flavens* group whose **major** is distinguished by the prominent "sharkfin" shape of the pronotal humerus in dorsal-oblique view. In this respect it resembles the major of *schmalzi* of South America but is distinct in the way the angles extend past the lower humeral margins in dorsal view, and in the wider, nearly perfectly semicircular shape of the occipital border. The **minor** has a much less prominent humeral profile in dorsal-oblique view than that of *schmalzi,* and the carinulae on the dorsal surface of the head do not extend beyond the eye.

Compare also with *arhuaca, boliviana, caulicola, chalca, chalcoides, crinata, flavifrons, mincana, sagana, tambopatae,* and *tysoni.*

MEASUREMENTS (mm) Holotype major: HW 0.88, HL 0.92, SL 0.42, EL 0.10, PW 0.46.

Paratype minor: HW 0.48, HL 0.54, SL 0.40, EL 0.06, PW 0.34.

COLOR Major: yellowish brown; head faintly bicolorous, with head capsule anterior to eye a slightly contrasting dark yellow.

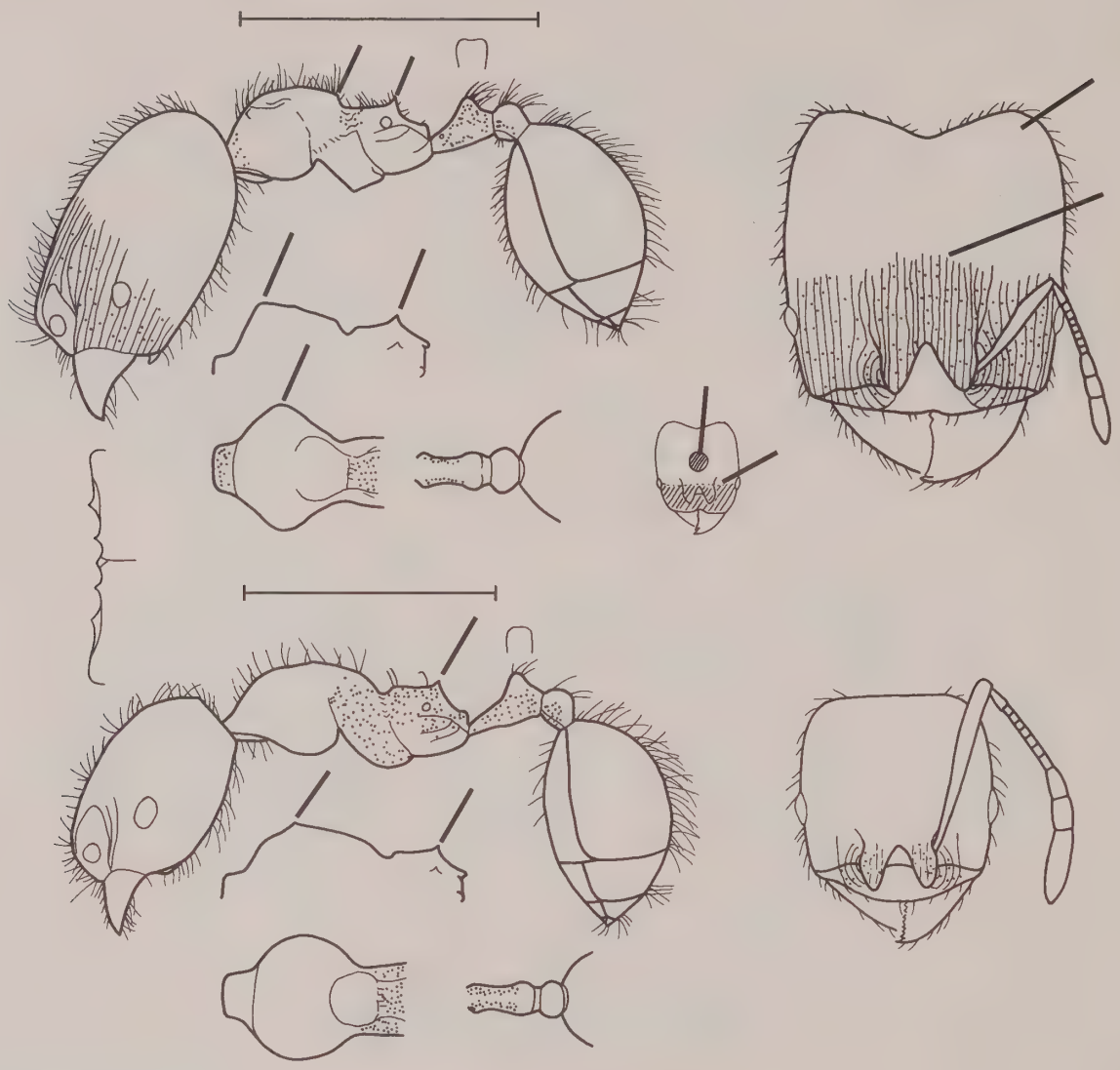
Minor: head light brown; gena a slightly contrasting dark yellow; anterior half of mesosoma dark yellow and posterior half yellowish brown.

RANGE Southern Pacific highlands of Costa Rica (J. T. Longino 1997).

BIOLOGY Occurs in wet montane forests; the type colony was found nesting in a hard dead branch (Longino 1997).

Compare with *amazonica, mackayi, minutula, quercicola*

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo (J. T. Longino). Scale bars = 1 mm.



Pheidole arboricola **new species**

TYPES INBio.

ETYMOLOGY L *arboricola,* tree-dwelling, alluding to the arboricolous nests of the species.

DIAGNOSIS A very small species, close to *amazonica, mackayi, minutula,* and especially *quercicola*, distinguished in the **major** from these species by its subangulate (as opposed to lobate) humerus in dorsal-oblique view, rounded lateral borders of the postpetiole, and bicolorous head.

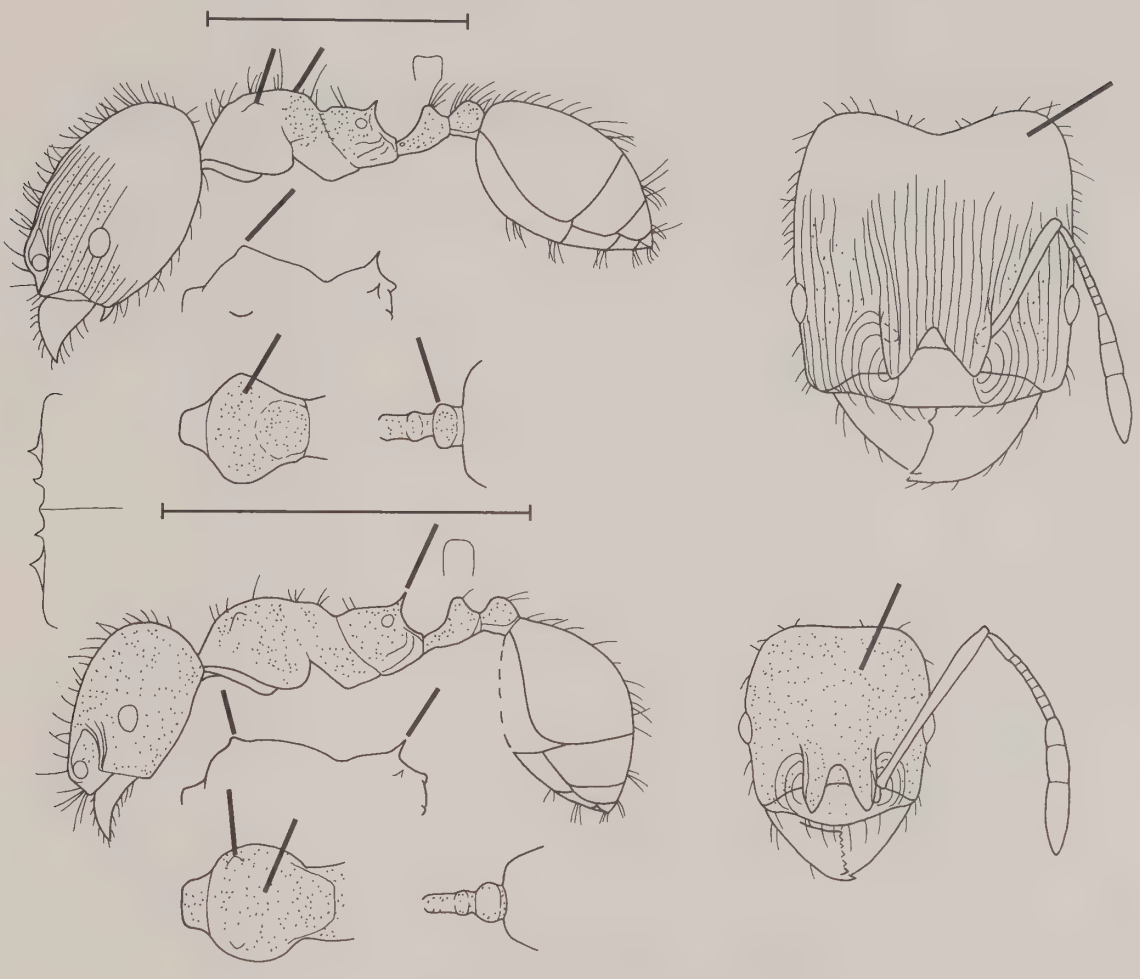
MEASUREMENTS (mm) Holotype major: HW 0.76, HL 0.84, SL 0.40, EL 0.06, PW 0.40.
Paratype minor: HW 0.42, HL 0.46, SL 0.40, EL 0.06, PW 0.26.

COLOR Major: head capsule anterior to eyes, along with a fuzzy circular spot in the middle of the capsule dorsum, light brown. Waist and gaster also light brown; rest of body and appendages dark yellow.
Minor: body medium brown, tarsi yellow, rest of appendages light brown.

RANGE Atlantic lowlands of Costa Rica, up to 500 meters elevation.

BIOLOGY John T. Longino (1997) reports *arboricola* as a resident of moist mature and second-growth forest, nesting in the hollow branches and under the dead bark variously of *Bauhinia, Cecropia, Stryphnodendron,* and other trees.

FIGURE Upper: syntype, major. Lower: syntype, minor. COLOMBIA: San Antonio, Sierra Nevada de Santa Marta (Auguste Forel). Scale bars = 1 mm.



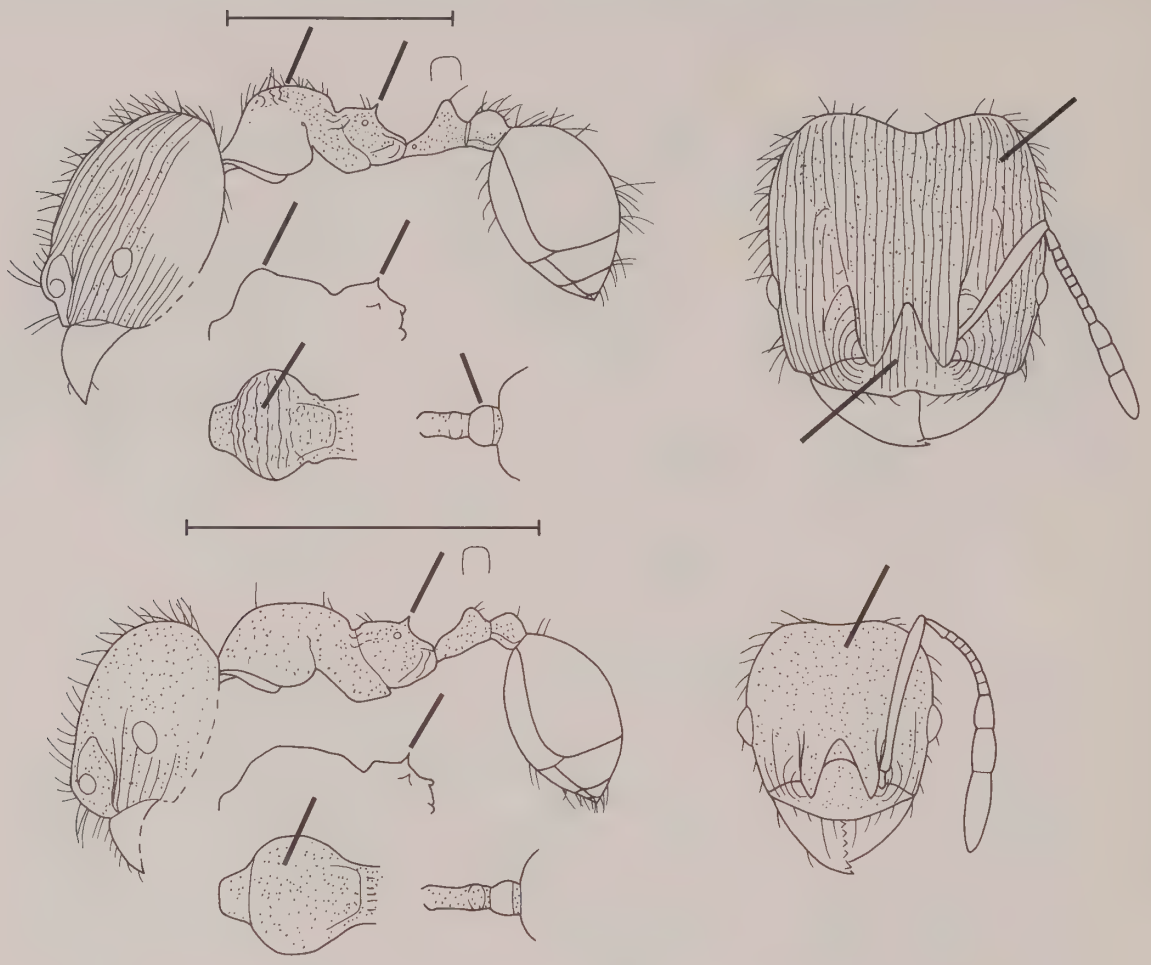
Pheidole arhuaca Forel

Pheidole arhuaca Forel 1901j: 364. Syn.: *P. arhuaca* var. *bimons* Forel 1912g: 234, n. syn.

TYPES Mus. Hist. Nat. Genève; Mus. Comp. Zool. Harvard.
ETYMOLOGY Referring to the type locality, San Antonio, an "arhuaque" (Arawak) village.
DIAGNOSIS A medium-sized, yellow species with conulate humerus in both **major** and **minor**, when seen in dorsal-oblique view. Close to *caulicola* of Costa Rica but with less prominent humeri, longer antennal scapes, and broader, more angulate postpetiolar node in both castes, as well as completely foveolate central pronotal dorsum in the **major**.
Also similar but less so to *chalca, chalcoides, mincana, schmalzi,* and *tragica.*
MEASUREMENTS (mm) Syntype major (Mus. Comp. Zool. Harvard): HW 0.80, HL 0.86, SL 0.40, EL 0.10, PW 0.44.
Syntype minor (Mus. Comp. Zool. Harvard): HW 0.46, HL 0.50, SL 0.44, EL 0.06, PW 0.30.
COLOR Major and minor: concolorous yellow.
RANGE Known only from the types of *arhuaca* sensu str. (Colombia) and of its variety *bimons* (Ceará, Brazil).
BIOLOGY Forel found the type colony under a dried pat of cow dung.

Compare with species listed in the Diagnosis below

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BOLIVIA: Salinas, Rio Beni. Scale bars = 1 mm.



Pheidole asperithorax Emery, **new status**

Pheidole minutula var. *asperithorax* Emery 1894d: 160. *Pheidole flavens* subsp. *asperithorax* Emery 1896g: 77.

TYPES Mus. Civ. Stor. Nat. Genova.

ETYMOLOGY L *asperithorax,* rough thorax, presumably with reference to the liberal amount of sculpturing on the mesosoma.

DIAGNOSIS A member of the "*flavens* complex" within the larger *flavens* group, including *asperithorax, breviscapa, exigua, flavens, nuculiceps, orbica,* and *sculptior,* as well as the less similar *nitidicollis* and species placed close to it (see under *nitidicollis*), and differing by the following combination of traits.

Major: humerus a prominent lobe that rises well above the rest of the promesonotum behind it in dorsal-oblique view; entire dorsal surface of the head, including occiput, all of clypeus, and frontal triangle, covered by parallel longitudinal carinulae; all of pronotal dorsum covered by transverse carinulae; most of dorsal head surface, the promesonotal dorsum, mesopleuron, propodeum, and sides of waist foveolate and opaque, with rest of body smooth and shiny; postpetiolar node from above forming a half-circle; propodeal spines short.

Minor: carinulae present on head anterior to level of eye; dorsum of postpetiolar node and all of gaster smooth and shiny, but all the rest of head and body foveolate and opaque.

MEASUREMENTS (mm) Lectotype major: HW 0.94, HL 0.96, SL 0.52, EL 0.10, PW 0.50.
Paralectotype minor: HW 0.48, HL 0.54, SL 0.44, EL 0.10, PW 0.32.

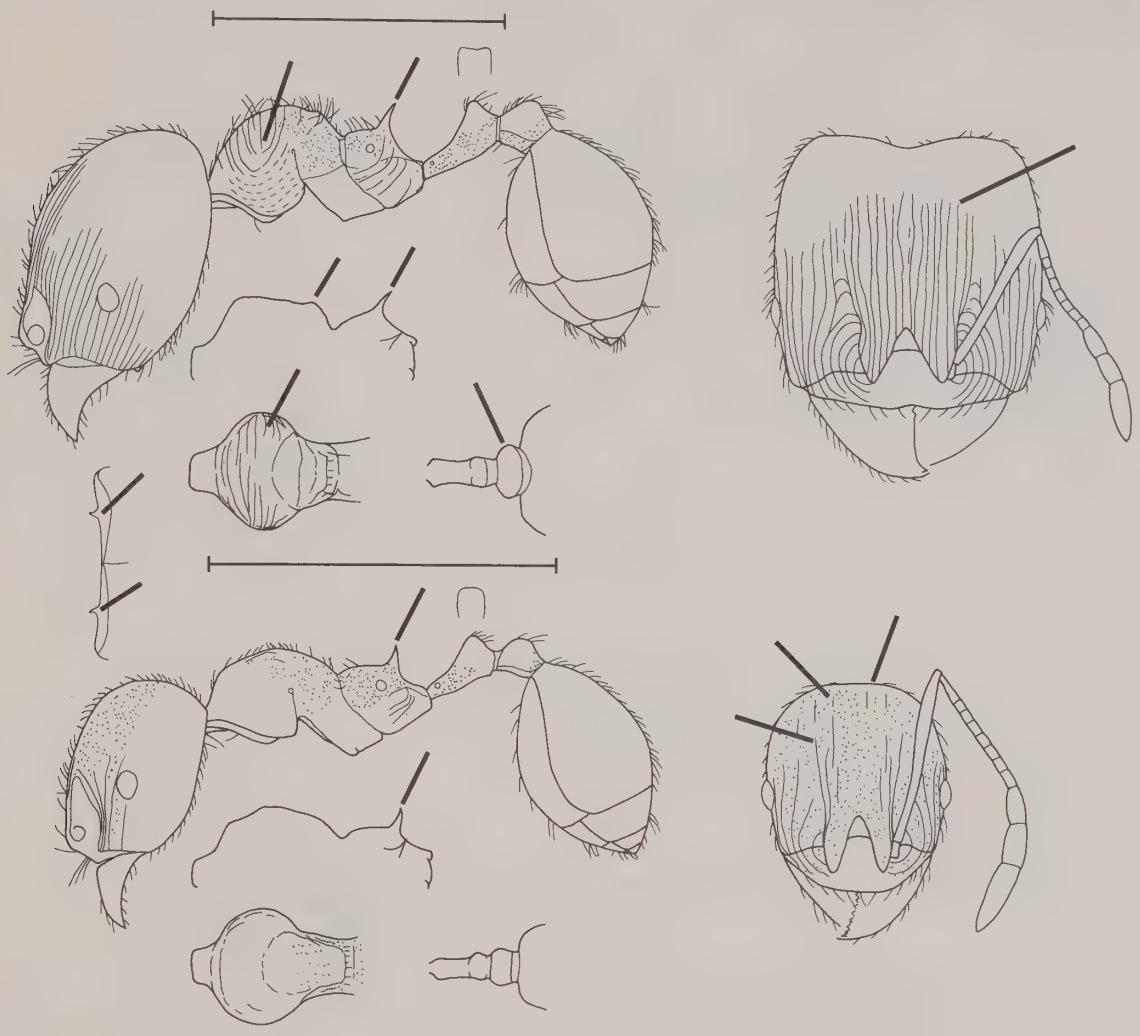
COLOR Major: concolorous medium reddish yellow.
Minor: light reddish yellow.

RANGE In addition to the types, I have seen series from Mato Grosso, Brazil, and near Puerto Maldonado, Tambopata, in the Peruvian Amazon.

BIOLOGY At Cuzco Amazónico, near Puerto Maldonado, Peru, Stefan Cover (unpublished collection notes) found three colonies of *asperithorax* in terra firme and seasonally flooded rainforest, nesting respectively in a rotten log, under the bark of an understory tree, and in a small rotten branch hanging in understory vegetation.

Compare with *alacris, dinophila, hazenae, lucaris, nana, ulothrix*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ARGENTINA: La Plata, Buenos Aires. Scale bars = 1 mm.



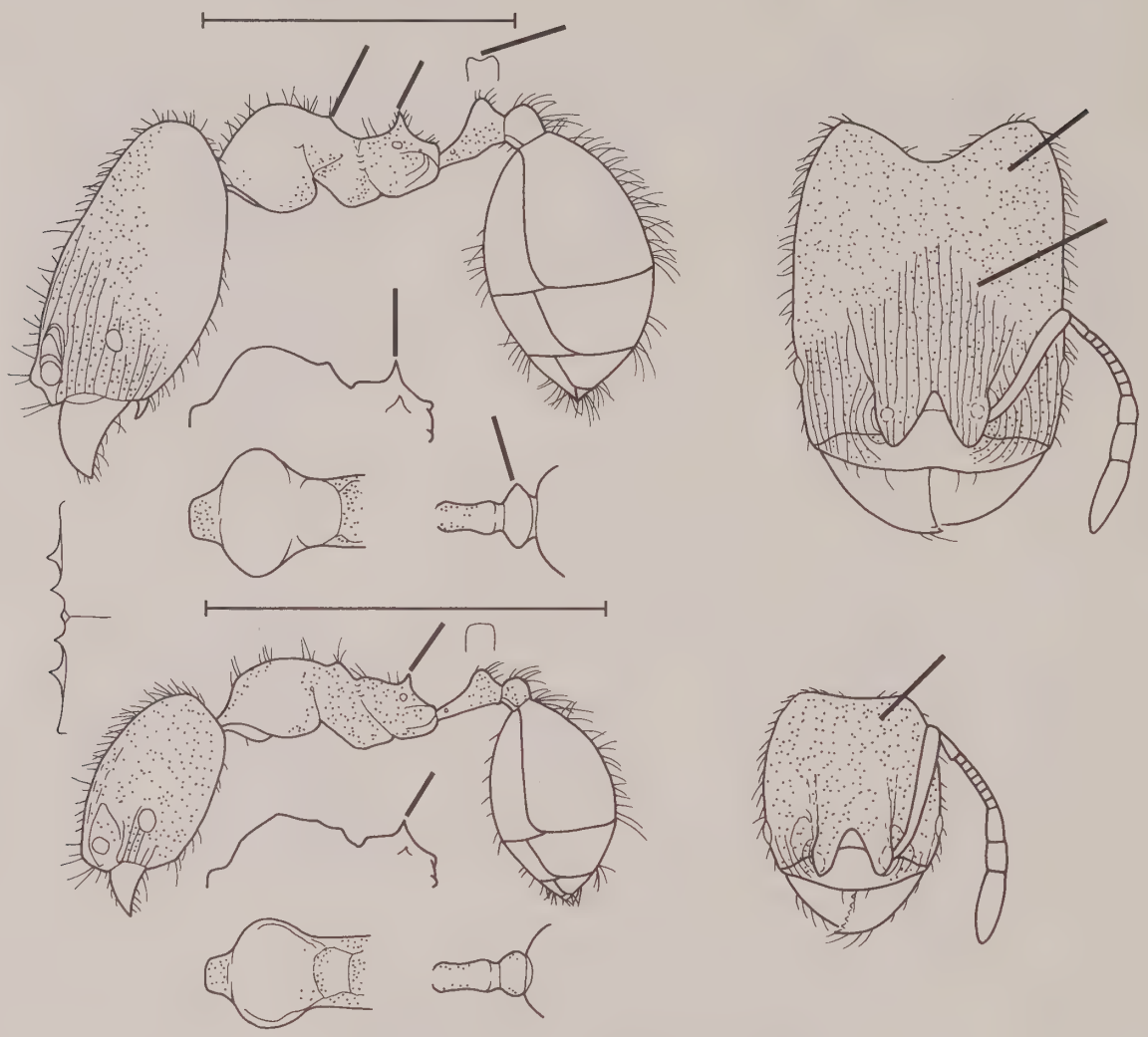
Pheidole atticola Forel, **new status**

Pheidole nana r. *atticola* Forel 1912g: 236

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *atticola,* living with *Atta* (leafcutter ants).
DIAGNOSIS Similar in various traits to the species listed in the heading above, distinguished as follows.
Major: propodeal spine more than half as long as propodeal basal face, and curving slightly backward; pronotum covered by curving carinulae, some of which are semicircular; hypostoma 2-toothed; mesonotal convexity present although low and indistinct; postpetiole from above elliptical.
Minor: broken carinulae extend from frontal lobes to occiput; propodeal spine nearly half as long as propodeal basal face, and curving forward; occiput narrowed, with weakly convex border, and lacking nuchal collar.
MEASUREMENTS (mm) Lectotype major: HW 1.04, HL 1.02, SL 0.56, EL 0.12, PW 0.48.
Paralectotype minor: HW 0.52, HL 0.54, SL 0.52, EL 0.10, PW 0.32.
COLOR Major: head and appendages light reddish yellow; rest of body light reddish brown.
Minor: body light brownish yellow, appendages clear medium yellow.
RANGE Known only from the type locality.
BIOLOGY The type colony was found in a nest of the large leafcutter ant *Acromyrmex lundii*; no further data were given by the collector.

Compare with *charazana, longinoi, neolongiceps, prolixa*

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: 4 km east of Turrialba, Cartago, 550 m (J. T. Longino). Scale bars = 1 mm.



Pheidole beloceps **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *beloceps,* arrow-headed, referring to the elongate and vertically thin head capsule.

DIAGNOSIS A small, yellow species whose **major** has an elongated head, the dorsal surface of which, with the exception of the mid-clypeus and frontal triangle, is completely foveolate and opaque; the rest of the cephalic sculpturing comprising longitudinal carinulae confined to the anterior half of the capsule; antennal scrobe absent; thick long, vertical propodeal spines are present, thin tips turning slightly forward in side view; small, subangulate mesonotal convexity present, and postpetiolar node conulate.

Similar to *charazana, longinoi, neolongiceps,* and *prolixa,* but differing from each in various combinations of the above traits, and other traits, as illustrated.

MEASUREMENTS (mm) Holotype major: HW 0.74, HL 0.96, SL 0.30, EL 0.06, PW 0.42.

Paratype minor: HW 0.40, HL 0.48, SL 0.36, EL 0.04, PW 0.26.

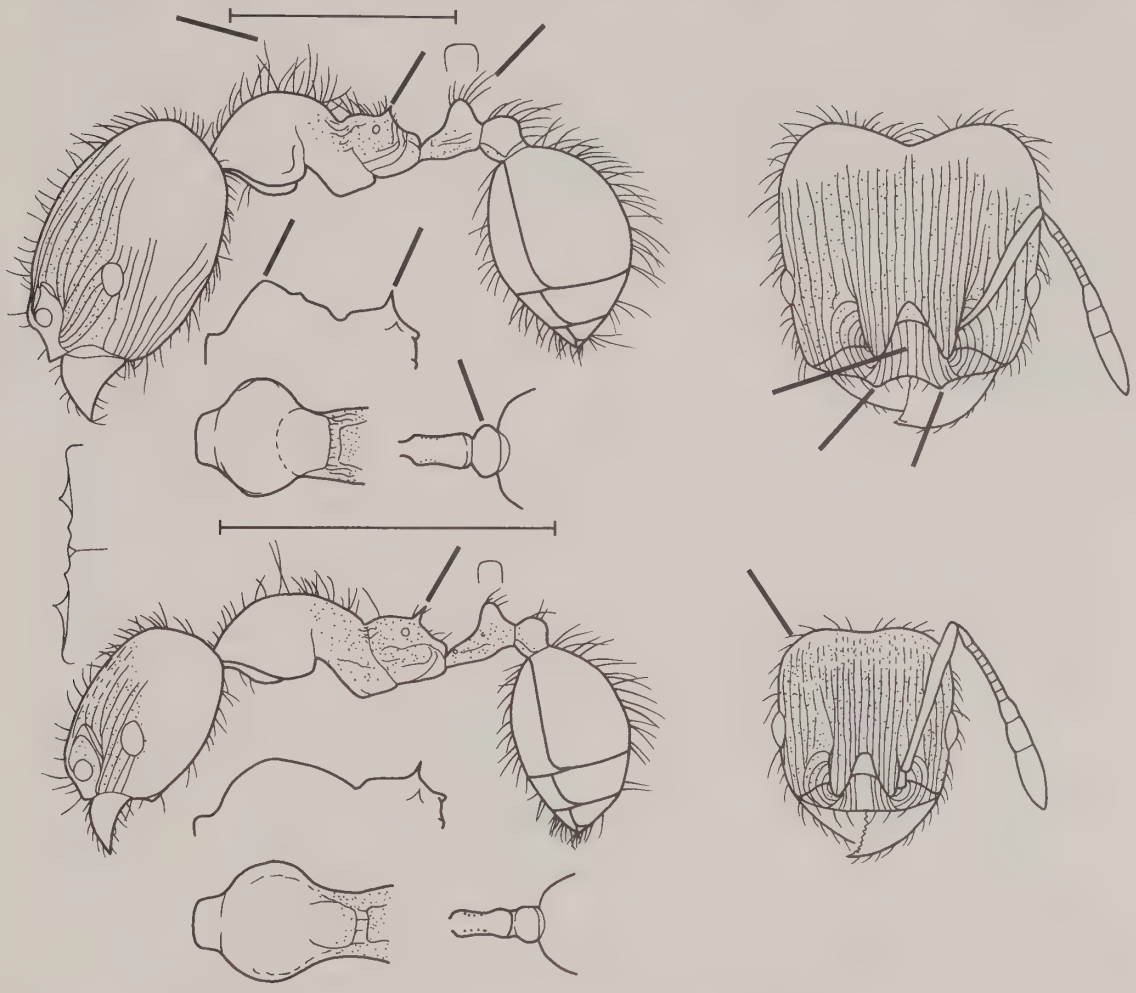
COLOR Major: body dark yellow, appendages medium yellow.

Minor: concolorous medium yellow.

RANGE Costa Rica.

BIOLOGY Found in leaf litter of lowland rainforest; workers were attracted to baits (Longino 1997).

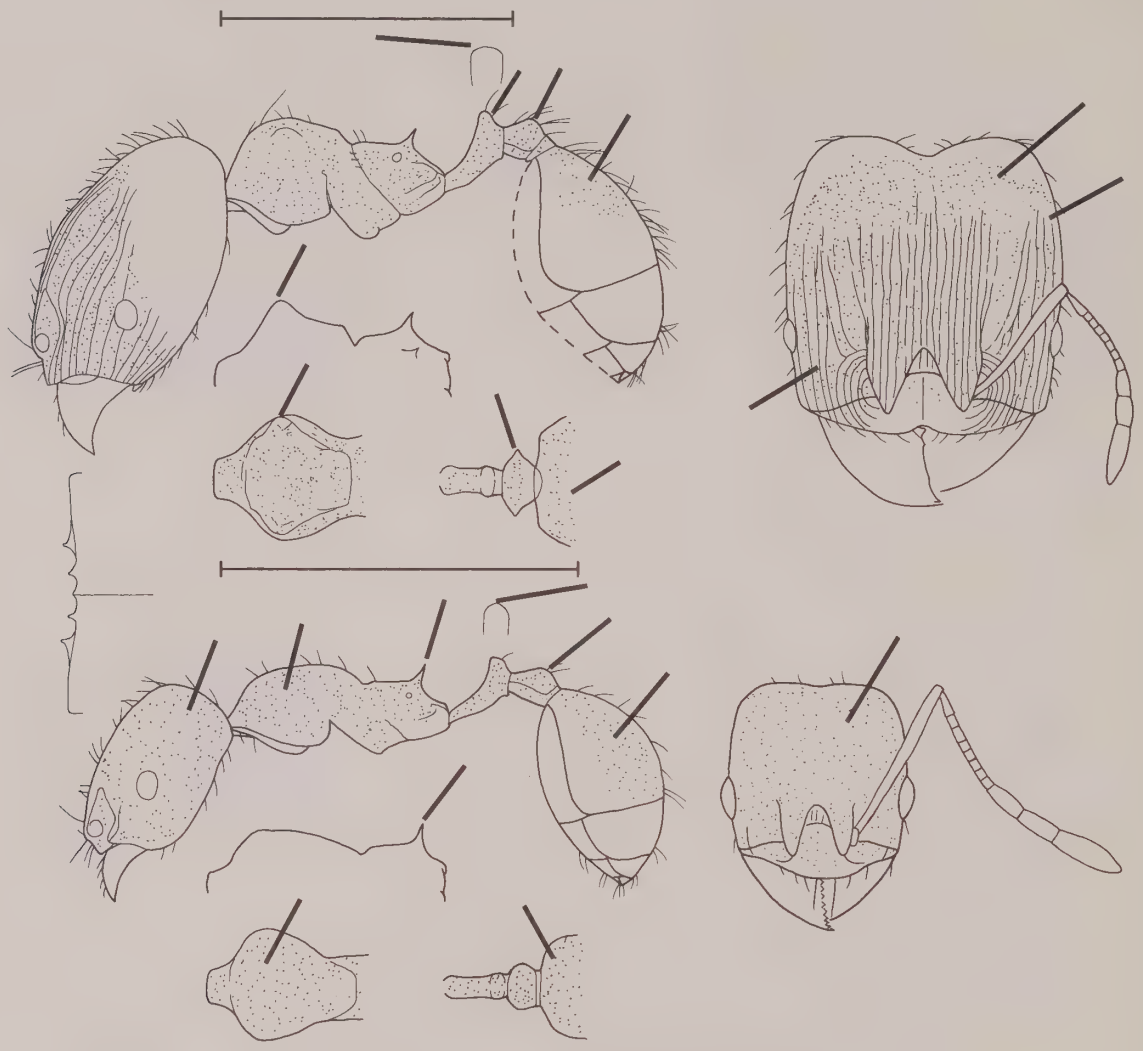
FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: Pirella Plantation (Iriboca), near Belém (P. F. Darlington). Scale bars = 1 mm.



Pheidole bidens **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *bidens,* two-toothed, referring to the clypeus.
DIAGNOSIS A medium-large, yellow member of the *flavens* group whose **major** is distinguished by the unusual bidentate anterior margin of the clypeus, heart-shaped head in full-face view, and completely carinulate clypeus.
Similar to *styrax* of Venezuela but different in absence of an antennal scrobe and many other details of body form, sculpturing, pilosity, and color, as illustrated.
See also the less similar *moffetti, nasutoides,* and *tennantae*.
MEASUREMENTS (mm) Holotype major: HW 1.04, HL 1.06, SL 0.56, EL 0.14, PW 0.44.
Paratype minor: HW 0.54, HL 0.58, SL 0.46, EL 0.06, PW 0.34.
COLOR Major: body and mandibles medium reddish yellow, appendages dark yellow.
Minor: body medium reddish yellow, appendages plain medium yellow.
RANGE Known only from the type series.
BIOLOGY Unknown.

FIGURE Upper: major. Lower: minor. COSTA RICA: Costa del Tablazo, 1500 m (syntypes of synonymous *P. ares* Forel, compared with *bilimeki* lectotype). (Type locality: Mexico.) Scale bars = 1 mm.



Pheidole bilimeki Mayr

Pheidole bilimeki Mayr 1870b: 985. Syn: *Pheidole anastasii* Emery 1896g: 76, n. syn. (Costa Rica); *Pheidole floridana* var. *deplanata* Pergande 1896: 883, n. syn. (provisional); *Pheidole floridana* var. *antoniensis* Forel 1901j: 364, n. syn. (Colombia); *Pheidole punctatissima* subsp. *annectans* Wheeler 1905c: 93, n. syn. (Bahamas); *Pheidole anastasii* var. *venezuelana* Forel 1905e: 159, n. syn. (Venezuela); *Pheidole punctatissima* subsp. *insulana* Wheeler 1905c: 93, n. syn. (Bahamas); *Pheidole anastasii* var. *johnsoni* Wheeler 1907b: 272, n. syn. (Honduras); *Pheidole anastasii* var. *cellarum* Forel 1908c: 55, n. syn. (Costa Rica); *Pheidole floridana* subsp. *ares* Forel 1908c: 57, n. syn. (Costa Rica); *Pheidole punctatissima* subsp. *jamaicensis* Wheeler 1908b: 161, n. syn. (Jamaica). Raised to species level in this monograph: *sospes*.

TYPES Naturhist. Mus. Wien.

ETYMOLOGY Eponymous.

DIAGNOSIS An abundant, widespread member of the *flavens* group easily distinguished by the following combination of traits.

Major: slender body form; humerus very prominent and lobose (see especially in dorsal-oblique view); postpetiole spinose, from above, petiolar node thin and tapered in side view; postpetiolar node low in side view; anterior two-thirds of dorsum of head longitudinally carinulate, not rugoreticulate, and all but the occiput and central piece of the clypeus foveolate and opaque; entire mesosoma and waist foveolate and opaque; anterior half of central strip of first gastral tergite shagreened and opaque.

Minor: slender body form; all of body except gastral venter and second to terminal gastral tergites foveolate and opaque; postpetiolar node in side view very depressed.

Longino (1997) has correctly observed that two forms of this species (or two closely related species) occur in Costa Rica: a rainforest understory form *("anastasii"),* with yellow minor workers, the occipital borders of which are convex with a weak median impression, and with majors possessing a foveolate occiput; and, coexisting with it in many places, a disturbed-habitat form *("annectans"),* with yellow to brown minors, the occipital corners of which are more nearly straight and lack a median impression, and with majors possessing a shining occiput. I have now had the opportunity to examine extensive series from over all the range of

bilimeki, including the types of *bilimeki* and all the infraspecific described variants listed in the synonymy. Longino may be correct, that two sibling species exist under *bilimeki,* but the variation is complex and its meaning uncertain. Forest series do tend to have majors with mostly foveolate occiputs over all the range, and disturbed-habitat series majors with shiny occiputs, although in both ecotypes there is considerable variation in the width of the shiny strip at or near the extreme occipital border. Both forms exhibit color variation in the minor, tending toward light to dark brown in montane localities. And the variation in the minor occiput is overall subtle and apparently continuous, and poorly correlated with minor head shape or major occipital sculpturation.

I have taken the conservative course in this complicated matter of recognizing only the single species *bilimeki*, until more detailed collections and field studies are forthcoming. If the division noted by Longino proves to correspond to two distinct species, then the name *bilimeki (= anastasii = insulana = ares = antoniensis = jamaicensis)* applies to the disturbed-habitat species, and *annectans (= johnsoni)* applies to the forest species. I cannot determine the placement of *cellarum* and *venezuelana* from my notes, but the relevance to nomenclature is moot. Although *venezuelana* was described the same year as *annectans* (1905), *annectans* was published at the earlier date (30 June 1905 versus 31 August 1905, for *venezuelana*). All of the infraspecific variation deserves a careful study, with correlative ecological analysis.

MEASUREMENTS (mm) Lectotype major: HW 0.90, HL 0.96, SL 0.44, EL 0.12, PW 0.46.

COLOR Major: body concolorous light brownish yellow; variation among series ranges from mostly yellow to medium brown. Similar variation in minors among series ranges from clear yellow to dark brown. Over most of the range (in both the forest and disturbed-habitat forms) color usually but not always varies with elevation.

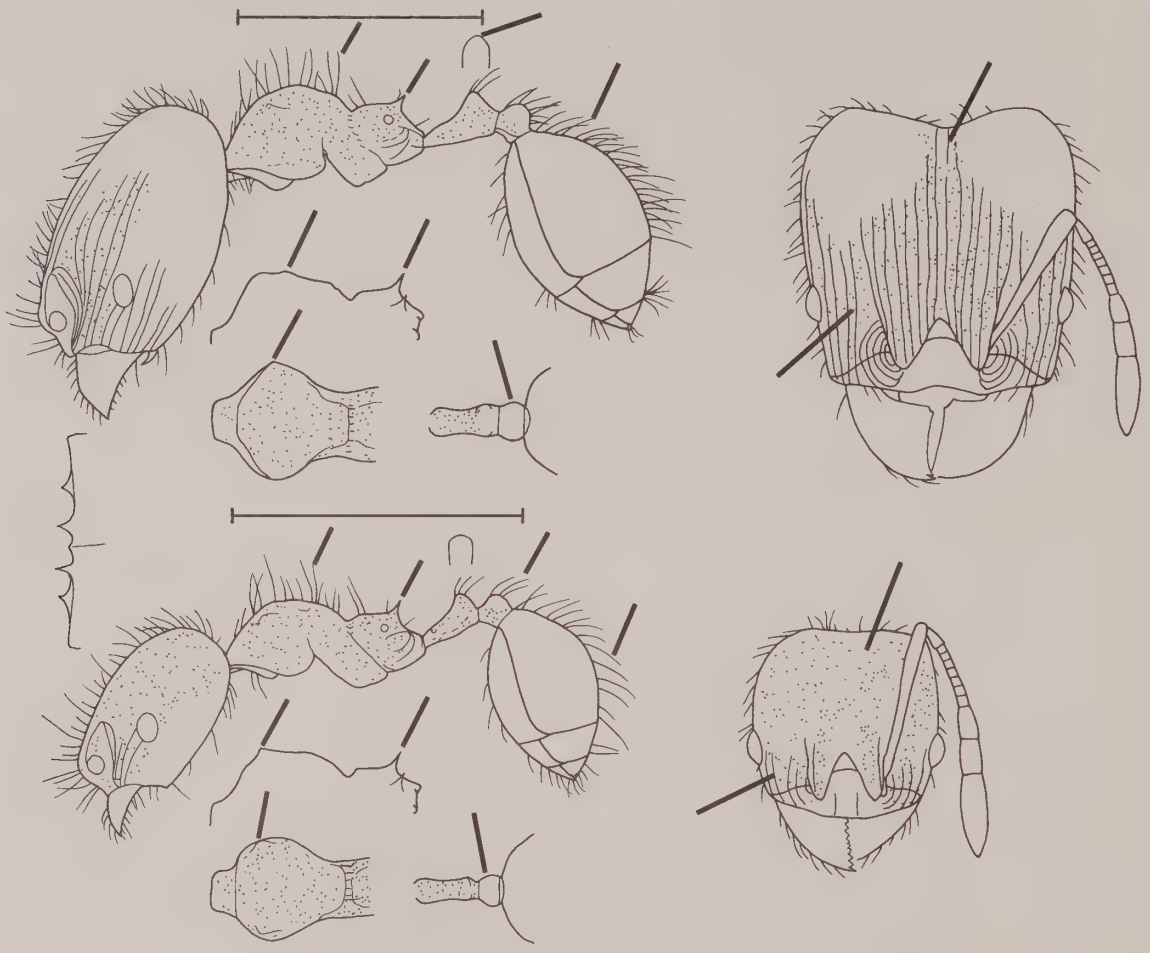
RANGE From Nayarit, Veracruz, and Oaxaca in southern and western Mexico, through all of Central America to montane Colombia and Venezuela, and also the greater Antilles (Cuba, Jamaica, Haiti, Dominican Republic) to the Bahamas. Occurs from near sea level variously to 450 m (as in Colombia), 1250 m (Costa Rica), 1450 m (Honduras), and 1100 m (Venezuela, Dominican Republic). Not known from the Lesser Antilles. *P. floridana* may represent a northern geographic variant of *bilimeki,* or an endemic species modified by intergradation with a *bilimeki* immigrant population (q.v.).

BIOLOGY *P. bilimeki,* whether a single species as broadly conceived, or two or more sibling species *(bilimeki, annectans)* is a specialist on the low arboreal zone of forests and other habitats that offer similar marginal nest sites. As such it is extraordinarily adaptable in its choice of nest sites, and in Costa Rica at least, one of the most abundant of ant species. There, as John T. Longino (1997) has observed, "Nests may be found in almost any kind of cavity or sheltered space, and [the ants] may augment their nest space by building galleries and tunnels with earthen construction. Nests have been observed in cavities in live stems of *Cephaelis* (Rubiaceae) and *Pausandra trianae* (Euphorbiaceae), bracts of *Ischnosiphon* (Marantaceae), clasping petiole bases of Araceae, and the bulbous leaf bases of *Tillandsia bulbosa*. It is a common opportunist inhabitant of myrmecophytes such as saplings of *Cecropia*, portions of myrmecophytic *Ocotea* trees abandoned by *Myrmelachista*, and myrmecophytic *Piper* species. In every Costa Rican population of myrmecophytic melastomes . . . that have been observed (Corcorado, La Selva, Tortuguero), this species has been the most abundant inhabitant . . . The species also nests in dead sticks and branches on or above the forest floor, and under bark flaps on tree trunks. When nests are in myrmecophytic melastomes, carton galleries may occur on the outside, connecting pouches and extending down the stem to the ground." In rainforest at the La Selva Biological Station, near Puerto Viejo, I found *bilimeki* to be the most common *Pheidole*—in fact virtually the only one—in the loose, dry leaf litter that collects in the leafbase baskets of small palms up to two meters or so from the ground.

According to Longino (1997), the colonies are apparently polygynous, and also occupy multiple nests. A colony from Monteverde, Costa Rica, that I maintained in the laboratory proved both prolific and extraordinarily restless, emigrating from one chamber of the nest to another, and even out of the nest into the foraging arena, when disturbed even slightly. Minor worker scouts rapidly recruited large numbers of majors and other minors to baits, which they collected or dragged into the nest with swift dispatch even for a Pheidole. Large dead insects were hoisted and carried cooperatively. *P. bilimeki* evidently has a wide breeding season. Winged reproductives have been found in March, August, and December in Costa Rica; August in Honduras and Veracruz; June in Venezuela, Honduras, and the Dominican Republic; and October in Haiti.

Compare with *amabilis, melastomae, mixteca, scitula, terresi, tysoni*

FIGURE Upper: holotype, major. Lower: paratype, minor. BOLIVIA: Las Gamas, P. N. Noel Kempff Mercado, Santa Cruz, 14°48′S 60°28′W, 700 m (Philip S. Ward). Scale bars = 1 mm.



Pheidole boliviana **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after country of origin of the type series.

DIAGNOSIS Medium-sized brown member of the *flavens* group, whose **major** and **minor** have exceptionally long, abundant, erect to suberect hairs over most of the body, foveolate and opaque mesosoma and petiole, and small, nearly oval postpetiolar node only slightly wider than the petiolar node.

Major: promesonotum with convexities in dorsal-oblique view; petiolar node in rear view strongly convex; carinulae on the midline dorsum of the head reach the occiput.

Minor: humerus angulate in dorsal-oblique view; dorsal surface of head mostly foveolate and opaque.

Similar to *amabilis, melastomae, mixteca, scitula, terresi,* and *tysoni,* differing in the combination of traits cited above.

MEASUREMENTS (mm) Holotype major: HW 0.86, HL 0.90, SL 0.46, EL 0.14, PW 0.44.

Paratype minor: HW 0.50, HL 0.54, SL 0.44, EL 0.10, PW 0.34.

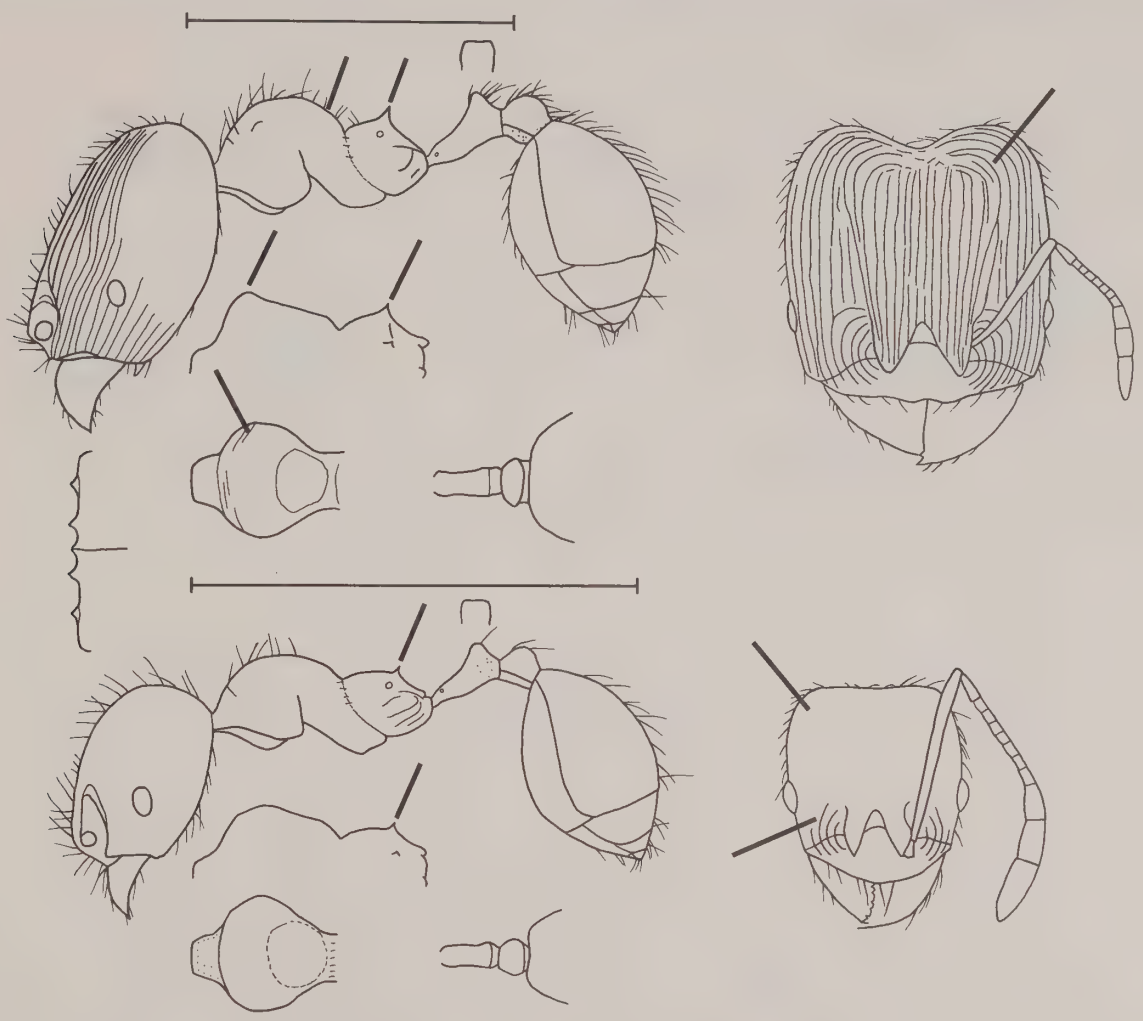
COLOR Major: head, mesosoma, waist, gaster, and antennae dark brown; legs brownish yellow.

Minor: dorsa of head and mesosoma medium brown; rest of body medium brown to brownish yellow; appendages brownish yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

FIGURE Upper: paratype, major. Lower: paratype, minor. BRAZIL: Cantazeiza, São Paulo (K. Lenko). Scale bars = 1 mm.



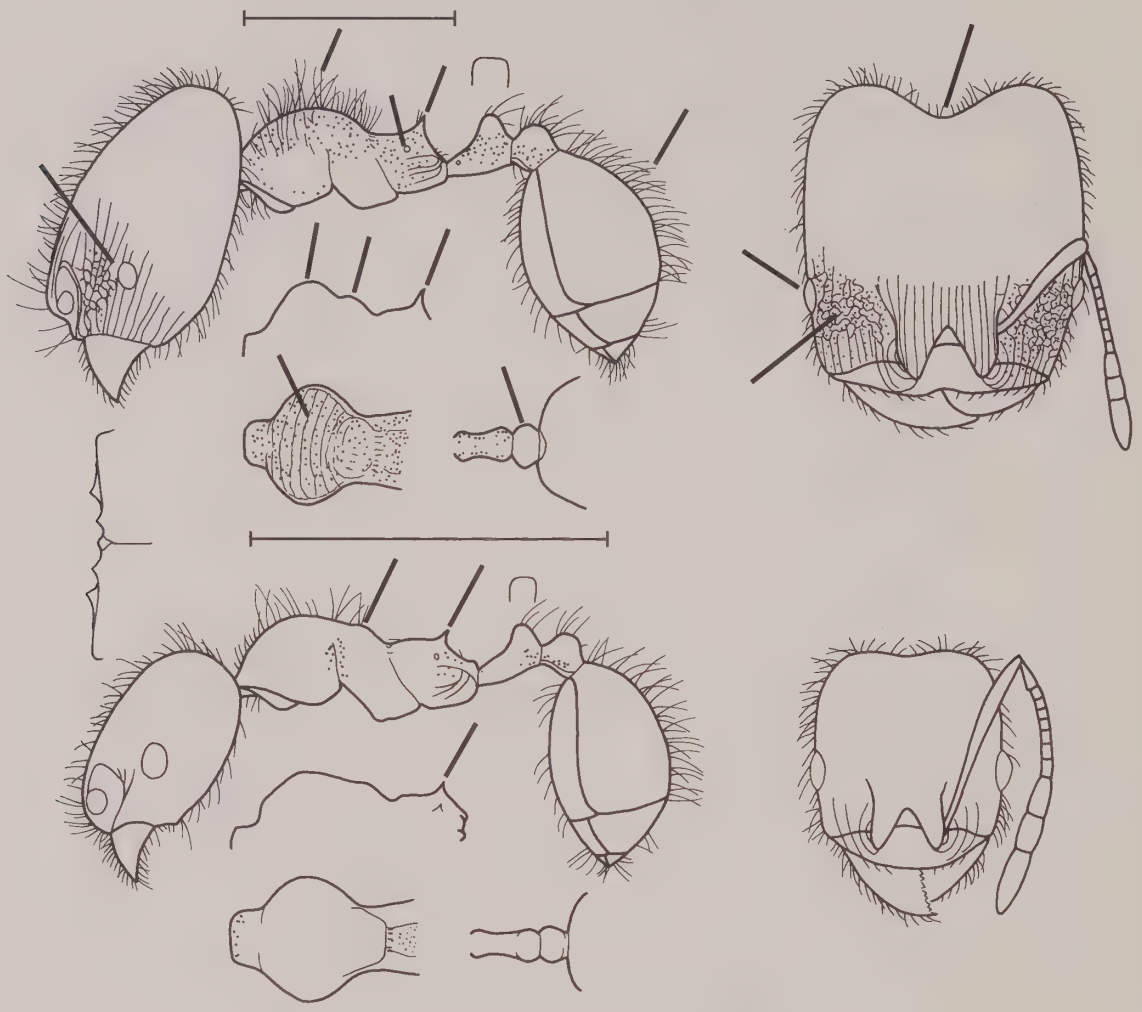
Pheidole borgmeieri Kempf

Pheidole borgmeieri Kempf 1972d: 461.

TYPES Mus. Zool. Univ. São Paulo; Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the Brazilian entomologist Fr. Thomas Borgmeier.
DIAGNOSIS A small member of the *flavens* group, most similar to *nana* of Brazil, differing from it and other species of the group as follows.
Major: all of head except frontal triangle and mid-clypeus covered by parallel longitudinal carinulae; the carinulae passing between the eyes and antennal fossae curve inward (mesad) as they approach the occiput, such that those from the two sides of the head meet at the midline near the occipital border; profile of promesonotum in side view forms a smooth, near-perfect semicircle; humerus extended as a prominent lobe in dorsal-oblique view; almost all of mesosoma, waist, and gaster smooth and shiny.
Minor: almost all of the body smooth and shiny; propodeal spines reduced to denticles.
MEASUREMENTS (mm) Paratype major: HW 0.76, HL 0.78, SL 0.40, EL 0.10, PW 0.40.
Paratype minor: HW 0.40, HL 0.44, SL 0.36, EL 0.06, PW 0.24.
COLOR Major: all of body yellow except gaster, which is a slightly contrasting light brown.
Minor: mesosoma and waist light brownish yellow, head and gaster a contrasting light brown.
RANGE The several series I have examined were all collected in São Paulo state, Brazil.
BIOLOGY Nests in rotting wood in rainforests.

Compare with *arhuaca, flavifrons, lustrata, moffetti, quercicola, tambopatae*

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Santa Rosa National Park, Guanacaste, 10°51′N 85°37′W, 100 m (J. T. Longino). Scale bars = 1 mm.



Pheidole brachyops **new species**

TYPES INBio.

ETYMOLOGY Gr *brachyops,* short eyes, referring to the proportionately small eyes of the major.

DIAGNOSIS A large, yellow member of the *flavens* group distinguishable as follows.

Major: proportionately small eyes and propodeal spiracles; short clypeus; deep concave cleft of occipital border in full-face view; bilobed profile of promesonotum in dorsal-oblique view; dense and full rugoreticulum between eye and antennal fossa; smooth posterior two-thirds of head dorsum; completely carinulate dorsad of pronotum; dense, long pilosity.

Minor: head and body almost completely smooth; propodeal spiracle tiny; propodeal spine thin, almost needle-like in side view.

See also the somewhat similar *arhuaca, flavifrons, lustrata, moffetti, quercicola,* and *tambopatae*.

MEASUREMENTS (mm) Holotype major: HW 1.20, HL 1.40, SL 0.64, EL 0.14, PW 0.56.

Paratype minor: HW 0.52, HL 0.56, SL 0.54, EL 0.10, PW 0.34.

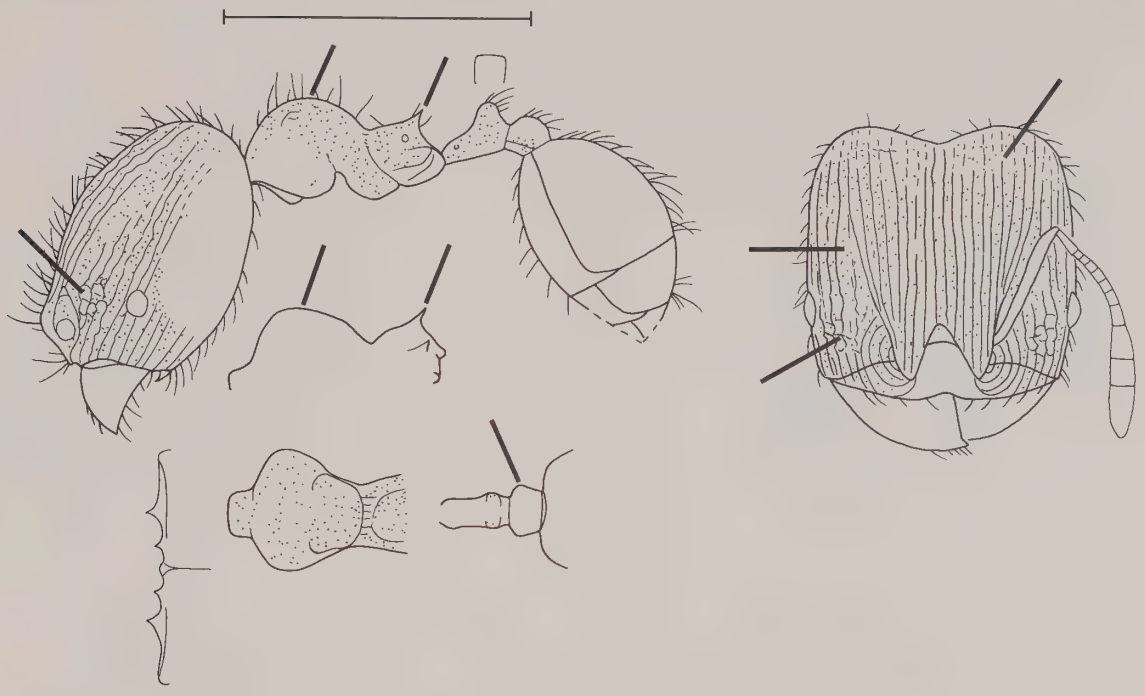
COLOR Major: concolorous dark yellow.

Minor: gaster brownish yellow, rest of body and appendages dark yellow.

RANGE Northwestern lowlands of Costa Rica (J. T. Longino 1997).

BIOLOGY Collected from tuna baits in the "bosque humedo" of Santa Rosa National Park, and from roadside vegetation near Lagartos, on the road to Monteverde (Longino 1997).

FIGURE Unique holotype, major. GUATEMALA: Retalhuleu. (Minor unknown.) Scale bar = 1 mm.



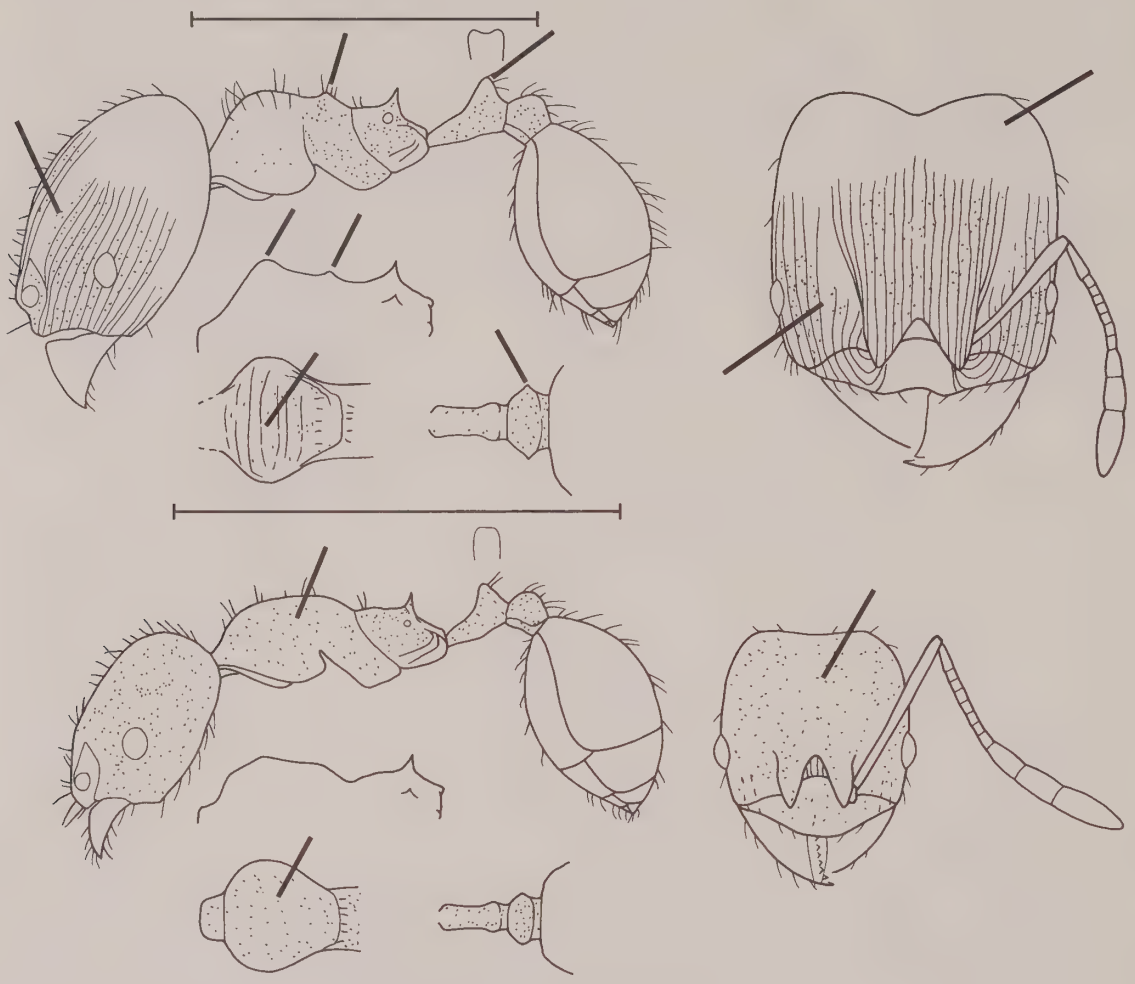
Pheidole breviscapa Forel, **new status**

Pheidole flavens var. *breviscapa* Forel 1899e: 77.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY L *breviscapa,* short-stemmed, alluding to the length of the antennal scapes.
DIAGNOSIS A marginal member of the "*flavens* complex" within the larger *flavens* group, comprising *asperithorax, breviscapa, bruchella, caracalla, exigua, flavens, orbica,* and *sculptior*. Distinguished in the **major** (the only caste known) by the combination of high, smooth convex, semicircular profile of the promesonotum; rudimentary, shallow antennal scrobes, whose surface is foveolate and opaque; presence of a small patch of rugoreticulum between the eye and antennal fossa; dorsum of head covered by longitudinal carinulae all the way to the occiput; sides of pronotum smooth and shiny, with remainder of mesosoma foveolate and opaque; and propodeal spines well developed and directed posteriorly.
MEASUREMENTS (mm) Holotype major: HW 0.72, HL 0.72, SL 0.34, EL 0.08, PW 0.38.
COLOR Major: yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *lignicola*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ARGENTINA: Alta Gracia, Córdova, type locality. Scale bars = 1 mm.

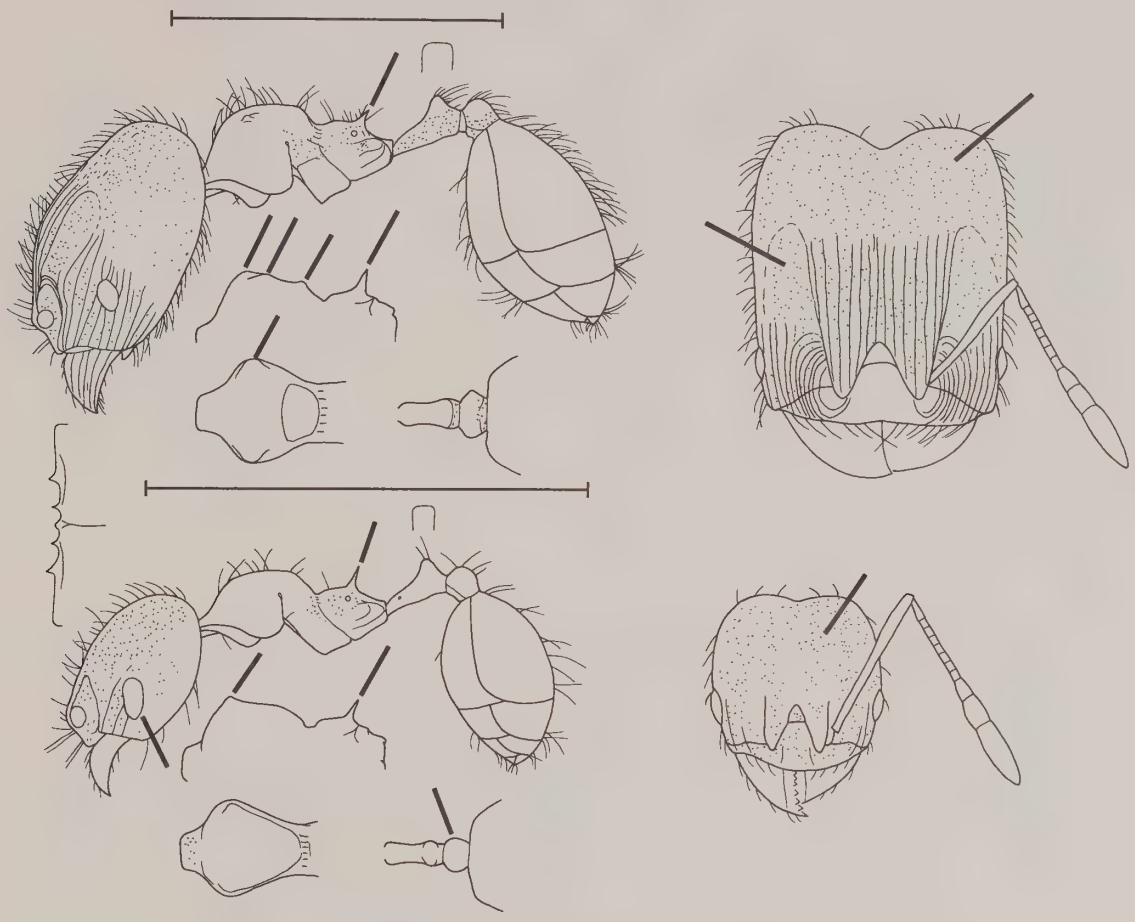


Pheidole breviseta Santschi

Pheidole flavens st. *breviseta* Santschi 1919f: 39. Raised to species level by Santschi 1923d: 60.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY L *breviseta,* short-haired.
DIAGNOSIS A medium-sized species with mesonotal convexity similar to *lignicola* of Argentina, Paraguay, and southern Brazil. **Major**: distinguished by its smooth occiput, cornulate postpetiole, relatively short pilosity, and yellow color.
MEASUREMENTS (mm) Lectotype major: HW 0.92, HL 0.94, SL 0.42, EL 0.12, PW 0.46.
Paralectotype minor: HW 0.42, HL 0.46, SL 0.38, EL 0.06, PW 0.26.
COLOR Major and minor: concolorous medium yellow.
RANGE Known only from the type series.
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (Stefan Cover). Scale bars = 1 mm.

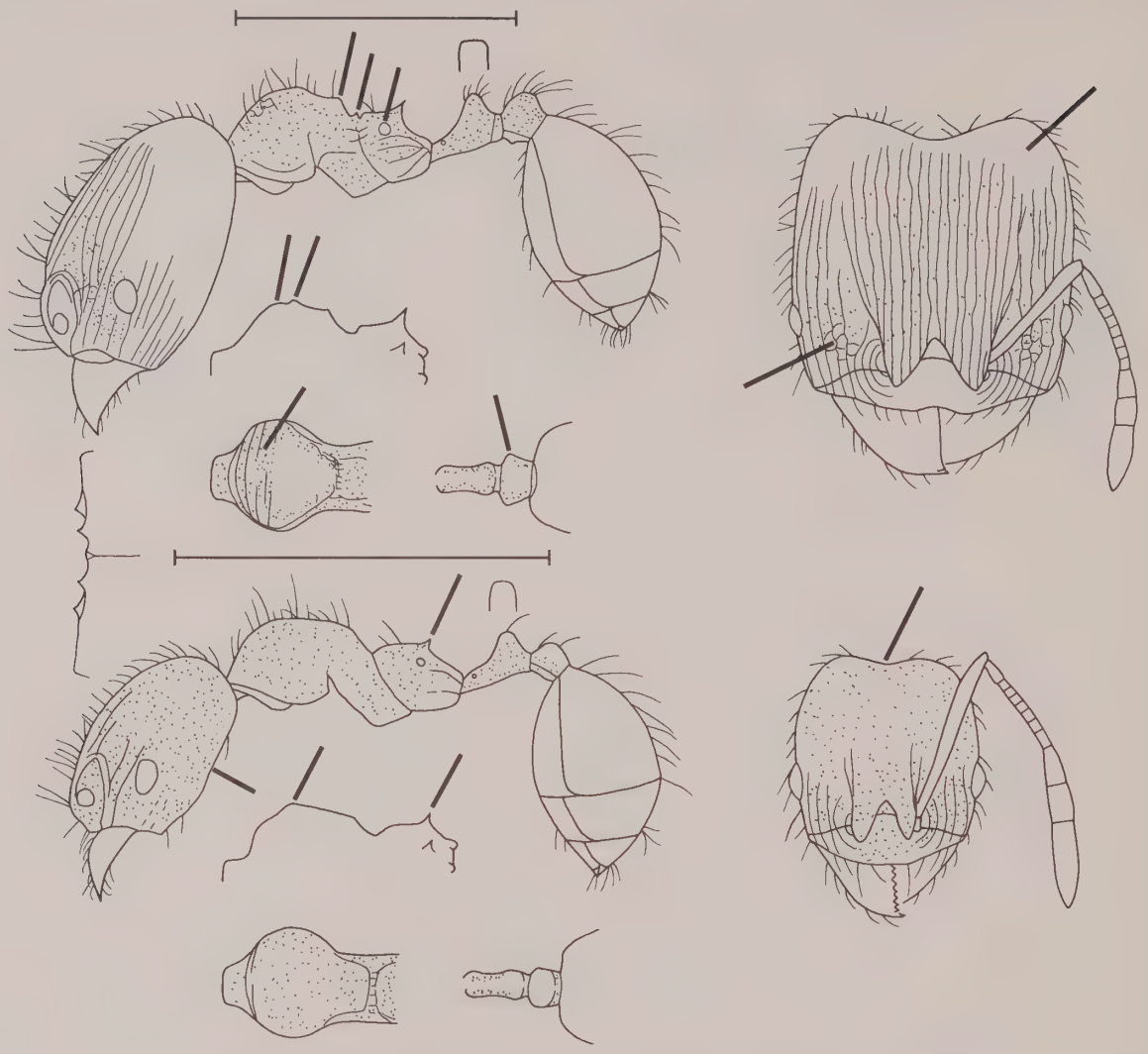


Pheidole browni **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named in memory of William L. Brown, pioneering systematist of the world ant fauna.
DIAGNOSIS A small, light reddish (**major**) or dark yellow (**minor**) member of the *flavens* group.
Major: distinguished by an elongated head, shallow antennal scrobes, 3-lobed promesonotum in dorsal-oblique view, large propodeal spines, and foveolate and opaque dorsal head surface.
Minor: propodeal spines long and thin; humerus in dorsal-oblique view toothed; dorsal head surface foveolate and opaque; eyes very large, anteriorly tapered.
Similar to *casta, mera, olsoni, prolixa,* and *protensa,* but easily distinguished by the traits listed above.
MEASUREMENTS (mm) Holotype major: HW 0.64, HL 0.76, SL 0.34, EL 0.12, PW 0.40.
Paratype minor: HW 0.36, HL 0.38, SL 0.32, EL 0.10, PW 0.26.
COLOR Major: concolorous light reddish yellow, with only a slight tinge of red.
Minor: concolorous dark yellow.
RANGE Atlantic slope of Costa Rica up to 1100 m (J. T. Longino 1997).
BIOLOGY Longino (1997) reports that *browni* nests in soil or in dead wood on the ground in wet forest. The species is captured frequently in Winkler samples. Longino observed a raid on a colony by *Simopelta* in the Braulio Carillo National Park at 1100 m elevation, in dense second-growth forest along a stream bank. Stefan Cover (personal communication) located five colonies in primary and secondary lowland rainforest at the type locality, nesting on the forest floor in rotten sticks and, in a single case, a rotten nut husk. Some of the colonies were spread over more than one nest site, and four of the five nests contained seed caches. Winged queens were present in nests at La Selva in March.

Compare with species listed
in the Diagnosis below

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. Scale bars = 1 mm.

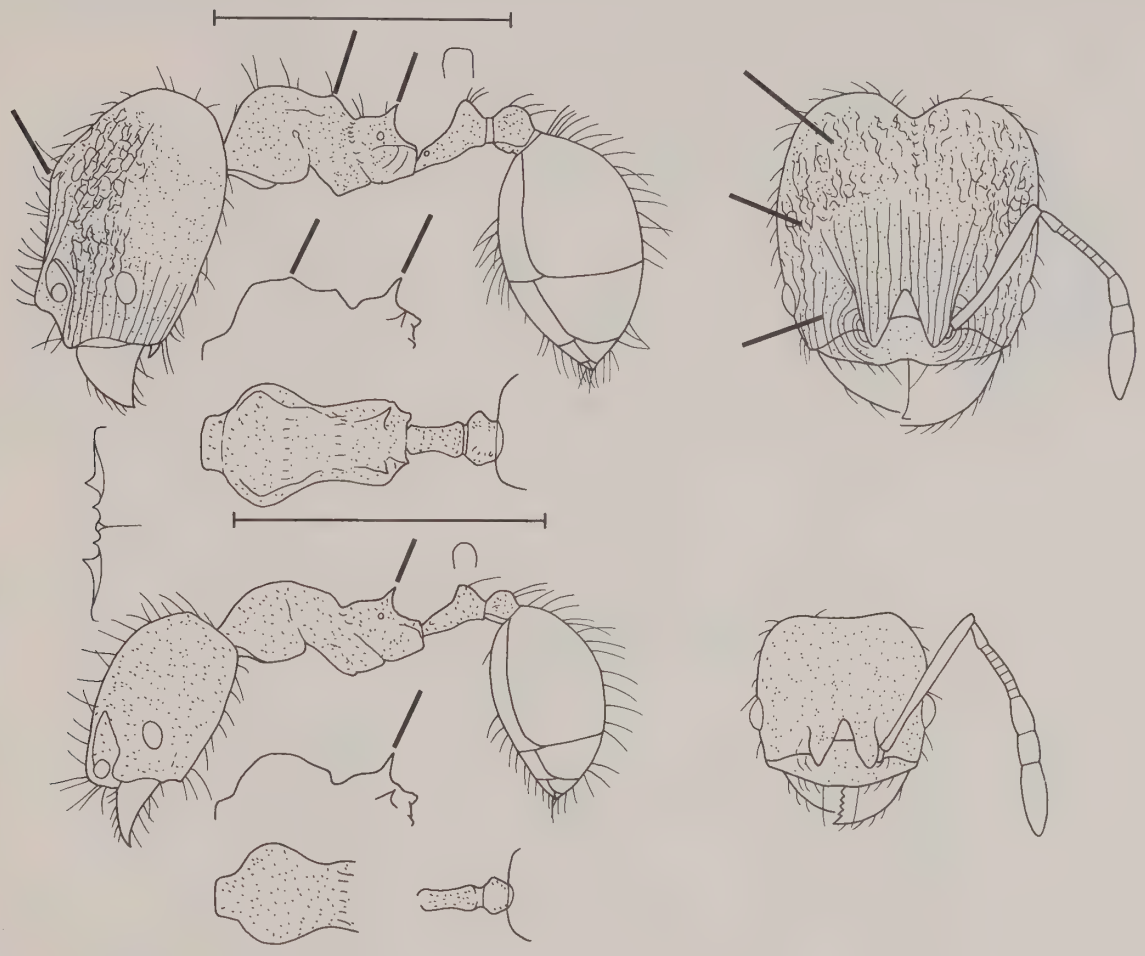


Pheidole bruchella Forel, **new status**

Pheidole lignicola var. *bruchella* Forel 1915c: 355.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY Named for the Argentine entomologist Carlos Bruch.
DIAGNOSIS Similar in various traits to *breviscapa, caracalla, micon, subreticulata,* and *tennantae,* differing as follows.
Major: brown; metanotum seen from side raised as a ridge; mesonotal convexity seen from side subangulate; pronotal dorsum in dorsal-oblique view bilobate; postpetiole from above trapezoidal; occipital lobes smooth and shiny; rugoreticulum present between eye and antennal fossa on each side; most of dorsal head surface and anterior half of pronotal dorsum carinulate.
Minor: ventral surface of head in profile feebly concave; all of head and mesosoma foveolate and opaque; propodeal spines small; occiput narrowed slightly, but with strongly concave margin and no nuchal collar.
MEASUREMENTS (mm) Lectotype major: HW 0.94, HL 0.94, SL 0.50, EL 0.10, PW 0.48.
Paralectotype minor: HW 0.44, HL 0.52, SL 0.62, EL 0.08, PW 0.30.
COLOR Major: body dark brown, appendages medium brown.
RANGE Known only from the type specimens: "Argentina," no further locality.
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. ECUADOR: 3 km east of Tandapi, Pichincha (Stewart B. and Jarmila Kukalová-Peck). Scale bars = 1 mm.



Pheidole camilla **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *Camilla,* a legendary Volscian huntress and warrior.

DIAGNOSIS A medium-sized, brown member of the *flavens* group, whose **major** is recognizable by a variable bulge in the middle of the dorsal surface of the head seen in side view, anterior to which the dorsal surface is variously rugulose and carinulate, and posterior to which the surface is covered by broken rugulae in the center and rugoreticulum on the side. In addition, the **major** is notable for its well-developed mesonotal convexity and large propodeal spines. At 50–60× some of the mesosomal and gastral hairs appear to have flattened apices. The **minor** has large spines and the entire body surface is sculptured, foveolate and opaque, except for the gaster, which is smooth and shiny.

Similar in some features to *alticola, euryscopa, hazenae, heterothrix, rectiluma, rectisentis, rectispina,* and *rectitrudis,* but notably different in others as illustrated.

MEASUREMENTS (mm) Holotype major: HW 0.94, HL 0.98, SL 0.58, EL 0.14, PW 0.40.
Paratype minor: HW 0.46, HL 0.50, SL 0.52, EL 0.08, PW 0.30.

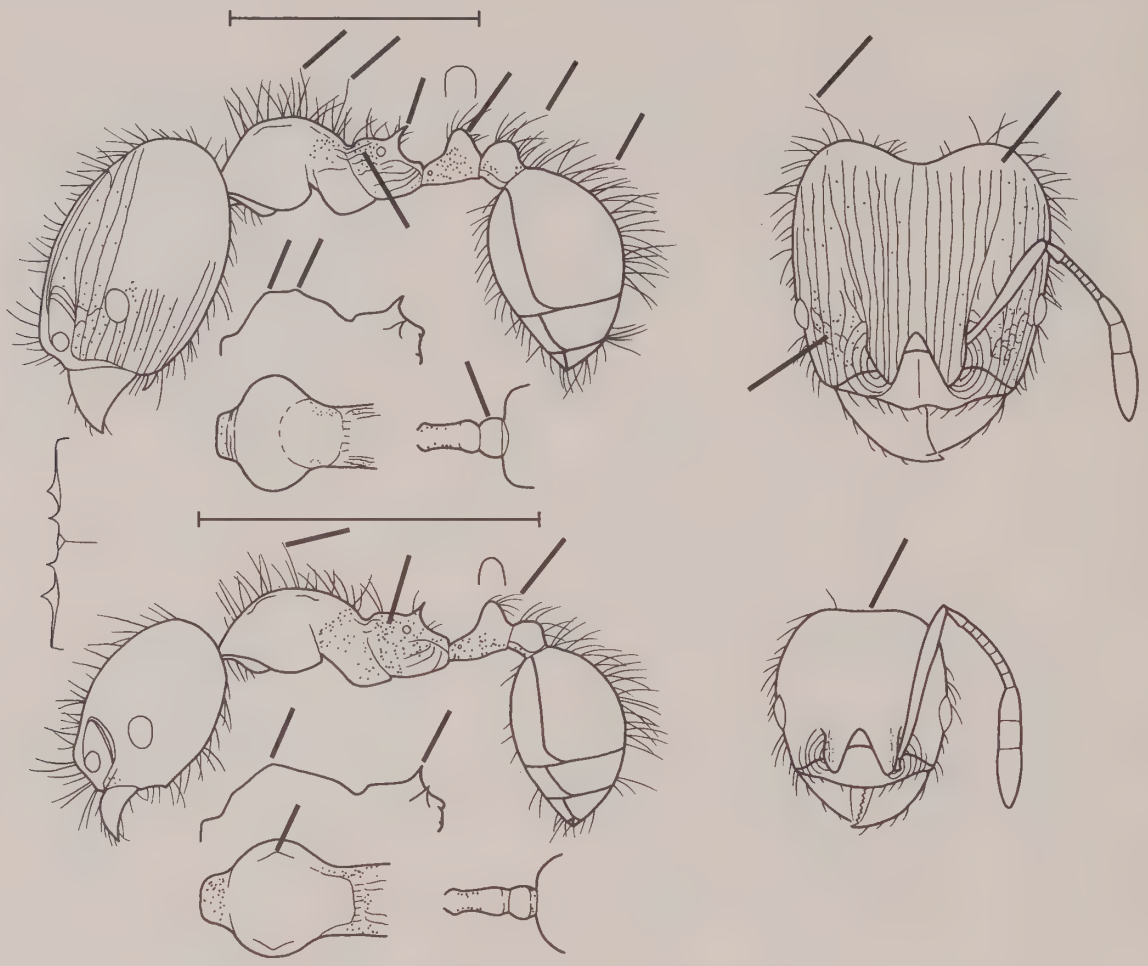
COLOR Major: body medium brown, tarsi yellow, other appendages light brown.
Minor: body blackish brown, mandibles and scapes medium brown, other appendages light brown.

RANGE Known only from the type locality.

BIOLOGY Unknown.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Tingo Maria, Huánaco (W. L. Brown and W. Sherbrooke). Scale bars = 1 mm.



Pheidole caracalla **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *caracalla,* great coat with hood, referring to the dense, long pilosity.

DIAGNOSIS Similar in various traits to *breviscapa, bruchella, micon, nana, subreticulata,* and *tennantae,* differing as follows.

Major: reddish brown; pilosity thick and long, especially on mesosoma, waist, and gaster, where many hairs are 1.5× Eye Length or longer; pronotum weakly bilobate in dorsal-oblique view; propodeal spines robust and moderately long; petiolar node in side view thick, its apex broad and rounded; postpetiole from above bell-shaped; a narrow band of rugoreticulum extends from eye to antennal fossa on each side; most of head carinulate, except for occiput, frontal triangle, and midclypeus; sides of propodeum carinulate.

Minor: reddish yellow; pilosity dense and long; pronotum in dorsal-oblique view subangulate; petiolar node in side view thick, with broadly rounded apex; occiput slightly narrowed, with straight posterior margin.

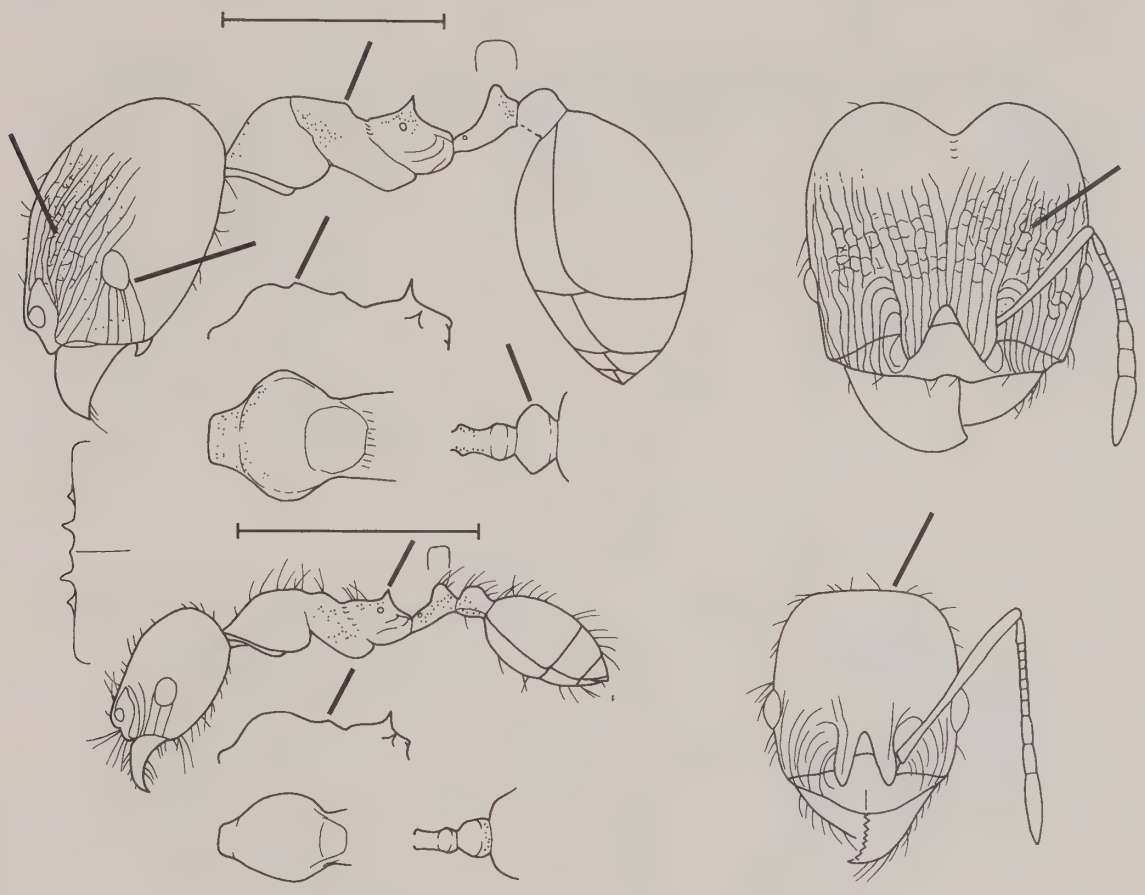
MEASUREMENTS (mm) Holotype major: HW 0.90, HL 0.90, SL 0.44, EL 0.12, PW 0.46.
Paratype minor: HW 0.52, HL 0.54, SL 0.46, EL 0.08, PW 0.32.

COLOR Major: light reddish brown except for gaster, which is dark brown.
Minor: medium reddish yellow except for gaster, which is dark brown.

RANGE Known only from the type locality and from Yasuni National Park, Puerto Tipugini, Ecuador (S. O'Donnell).

BIOLOGY Winged queens were found in March at the type locality and in April in Yasuni National Park (S. O'Donnell).

FIGURE Upper: syntype, major (a composite from 2 damaged specimens; Carapunco, between Tafi de Valle and Infiernillos, Tucumán, 2600 m, N. Kusnezov). Lower: minor (El Rey, Salta, 2200 m, N. Kusnezov). *The major syntype is partly decayed, and may have lost most of its pilosity*. The El Rey minor is undecayed, and the pilosity appears intact. Scale bars = 1 mm.



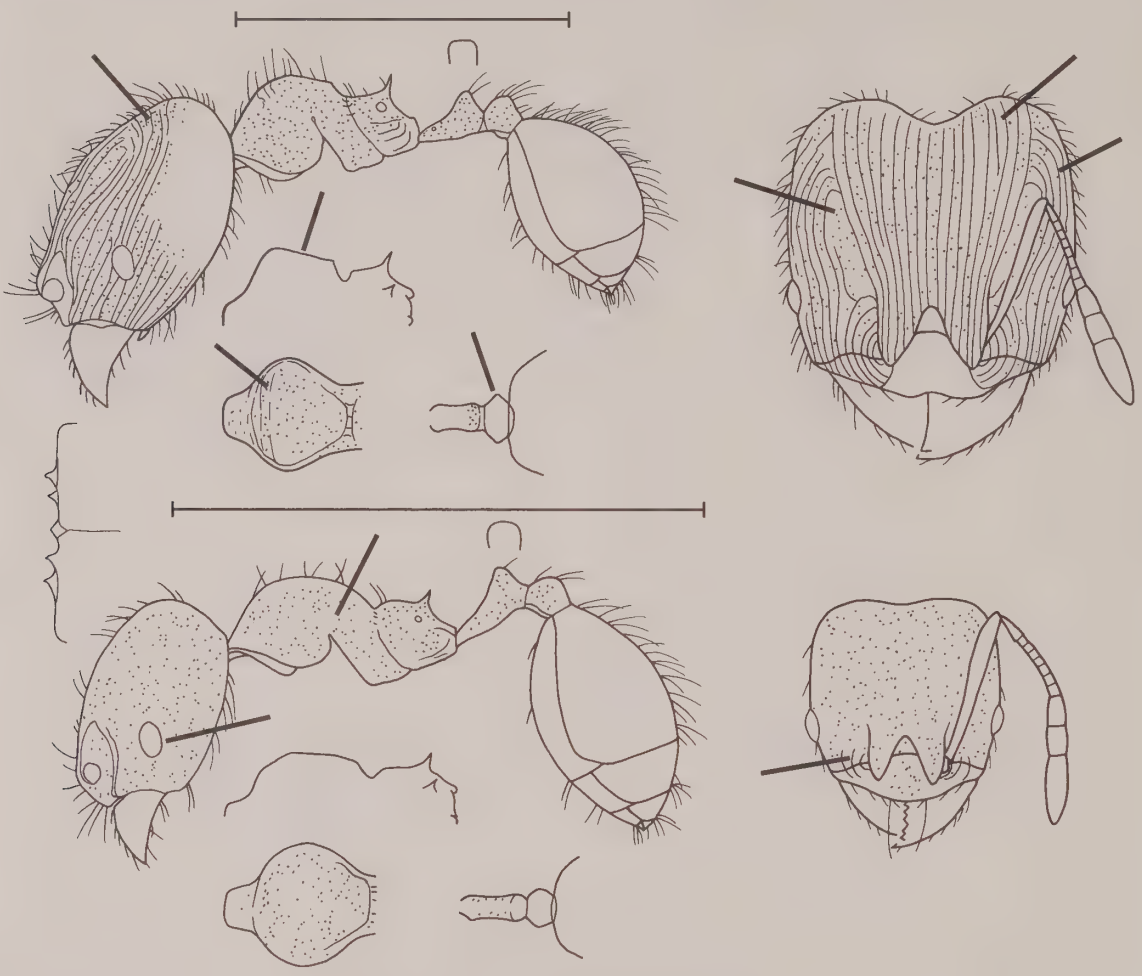
Pheidole carapunco Kusnezov

Pheidole carapunco Kusnezov 1952d: 82.

TYPES Mus. Comp. Zool. Harvard; Inst. Miguel Lillo, Tucumán.
ETYMOLOGY Named after the type locality.
DIAGNOSIS Placed tentatively in the *flavens* group, but with a habitus intermediate to that of the *tristis* group.
Major: large (for *flavens* group); carinulae originating on anterior margin of the eye spread forward from one another in traveling to the genal border; a broad, continuous band of rugoreticulum extends from the inner margin of one eye to that of the other across the vertex. The true characteristics of this species will remain problematic until fresh material is collected.
MEASUREMENTS (mm) Syntype major: HW 1.20, HL 1.24, SL 0.62, EL 0.20, PW 0.54.
Minor: HW 0.52, HL 0.60, SL 0.48, EL 0.10, PW 0.14.
COLOR Major: concolorous medium reddish brown.
Minor: head and gaster yellowish brown; mesosoma, waist, and appendages dark yellow.
RANGE A temperate montane Argentine species, known only from Salta and Tucumán.
BIOLOGY Unknown.

Compare with *chloe, goeldii, mittermeieri, nuculiceps, sculptior, striaticeps*

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios (Stefan Cover and John E. Tobin). Scale bars = 1 mm.



Pheidole cardiella **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *cardiella,* little heart, referring to the head shape of the major.

DIAGNOSIS A member of the *flavens* group, most similar to the species listed in the heading, distinguished by the following combination of traits.

Major: head with mandibles in full-face view almost perfectly heart-shaped; antennal scrobes present; vertex near occiput conspicuously depressed; entire dorsal surface of head, except for frontal triangle, mid-clypeus, and antennal scrobes, longitudinally carinulate; carinulae originating on frontal lobes curve weakly inward as they approach occiput, and carinulae laterad to the antennal scrobes curve strongly inward to meet those originating on the frontal lobes; all of mesosoma foveolate and opaque; postpetiole diamond-shaped.

Minor: all of head and mesosoma foveolate and opaque; eye set forward on head, separated from genal border by a distance about equal to Eye Length; carinulae on head fail to reach eye level.

MEASUREMENTS (mm) Holotype major: HW 0.72, HL 0.72, SL 0.36, EL 0.08, PW 0.34.
Paratype minor: HW 0.38, HL 0.42, SL 032, EL 0.06, PW 0.24.

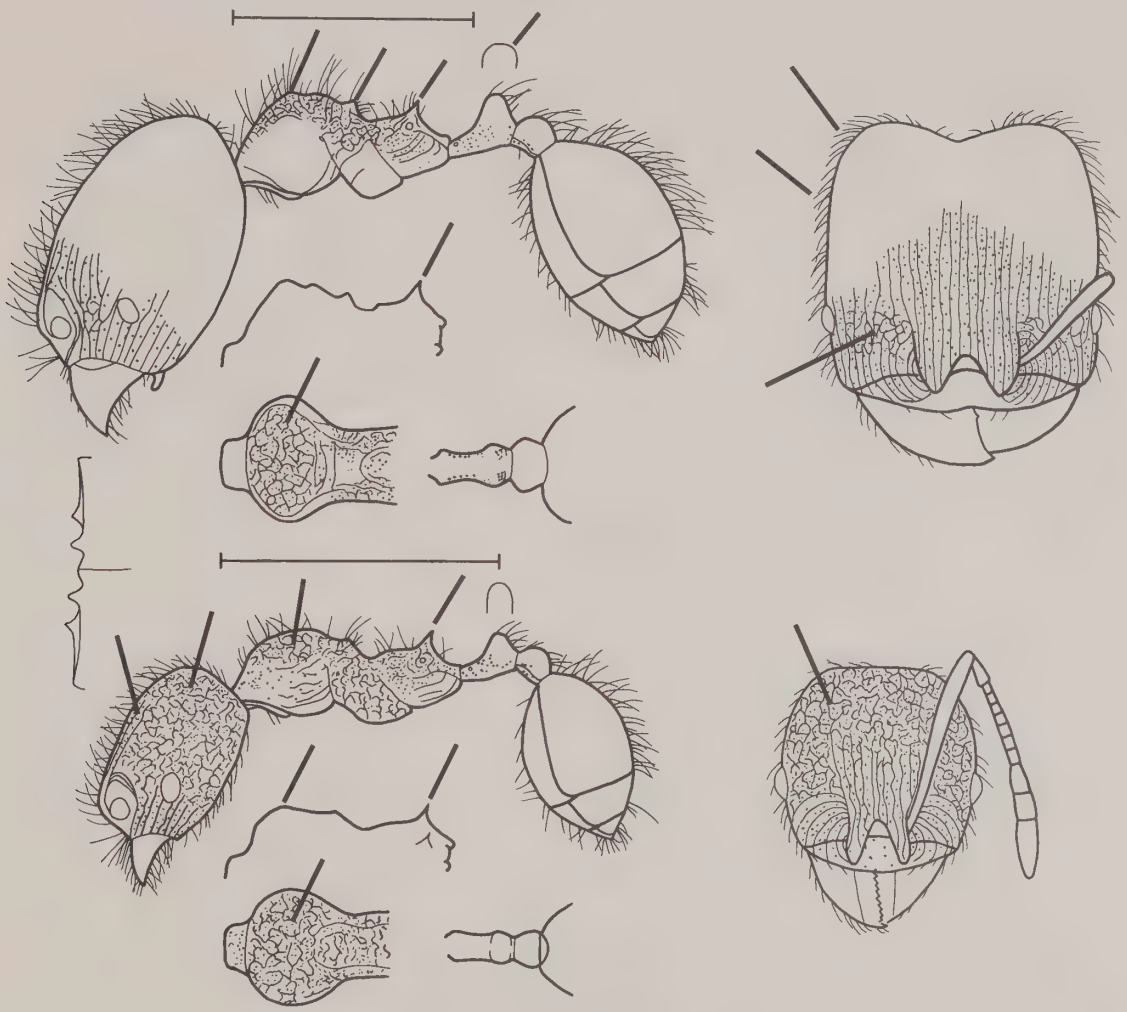
COLOR Major: mesosoma, waist, and anterior strip of first gastral tergite yellowish brown; head and rest of gaster medium brown; appendages medium yellow.
Minor: concolorous dark yellow.
Both castes are sometimes much darker in shade.

RANGE Recorded from the type locality and from Manabí and Pichincha Provinces of Ecuador.

BIOLOGY At Cuzco Amazónico Stefan Cover (personal communication) found *cardiella* in both terra firme and seasonally flooded rainforest, nesting in soil, litter, and small pieces of rotten wood. Colonies appeared to be small, and in some cases occupied more than one nest site.

Compare with *kuna, obtusopilosa, quadriceps, rectisentis, scabriventris, termitobia*

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Monteverde, Puntarenas, 10°18′N 84°48′W, 1560 m (J. T. Longino). Scale bars = 1 mm.



Pheidole carinata **new species**

TYPES INBio.

ETYMOLOGY L *carinata,* keeled or ridged, referring to the ridge-like mesonotal convexity in the major.

DIAGNOSIS A large brown member of the *flavens* group whose **major** is distinguished by its square head shape in frontal view, angulate profile of the mesonotal convexity, and rugoreticulate mesosomal dorsum.

The **minor** is very distinctive in the completely rugoreticulate condition of the posterior half of the head, promesonotal dorsum, and mesopleuron.

Similar to *quadriceps* of Colombia but differs in the **major** by its much shorter propodeal spine, less extensive sculpturing on the head, the rugoreticulum of the mesosoma, which is completely lacking in *quadriceps,* and in color, and in the **minor** by the mesosomal rugoreticulation, which is absent in the *quadriceps* minor, and also in color. See also the less similar *kuna, obtusopilosa, rectisentis, scabriventris,* and *termitobia*.

MEASUREMENTS (mm) Holotype major: HW 1.14, HL 1.14, SL 0.62, EL 0.14, PW 0.54.

Paratype minor : HW 0.54, HL 0.66, SL 60, EL 0.06, PW 0.38.

COLOR Major: head bicolorous, with head anterior to eyes yellow and remainder of head light brown (the holotype may be a callow); body light brown; tarsi and funiculi yellow; rest of legs light brown.

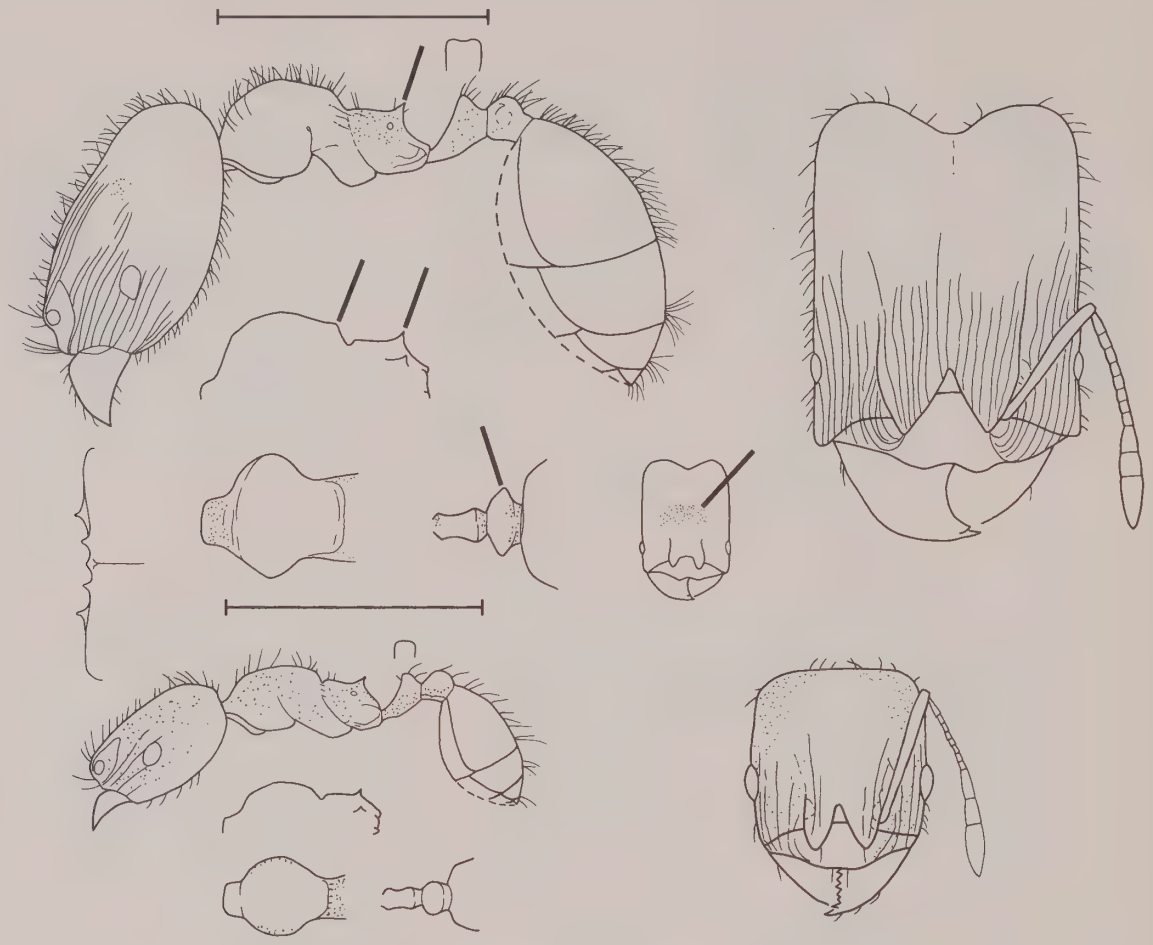
Minor: body dark brown; tarsi and funiculi dark yellow; rest of appendages medium brown.

RANGE Known only from the type locality.

BIOLOGY Occurs in leaf litter of cloud forest (Longino 1997).

Compare with *mera, guajirana, tysoni*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. TEXAS: Canyon of the Rio Grande, Langtry, Texas (W. M. Wheeler). Scale bars = 1 mm.

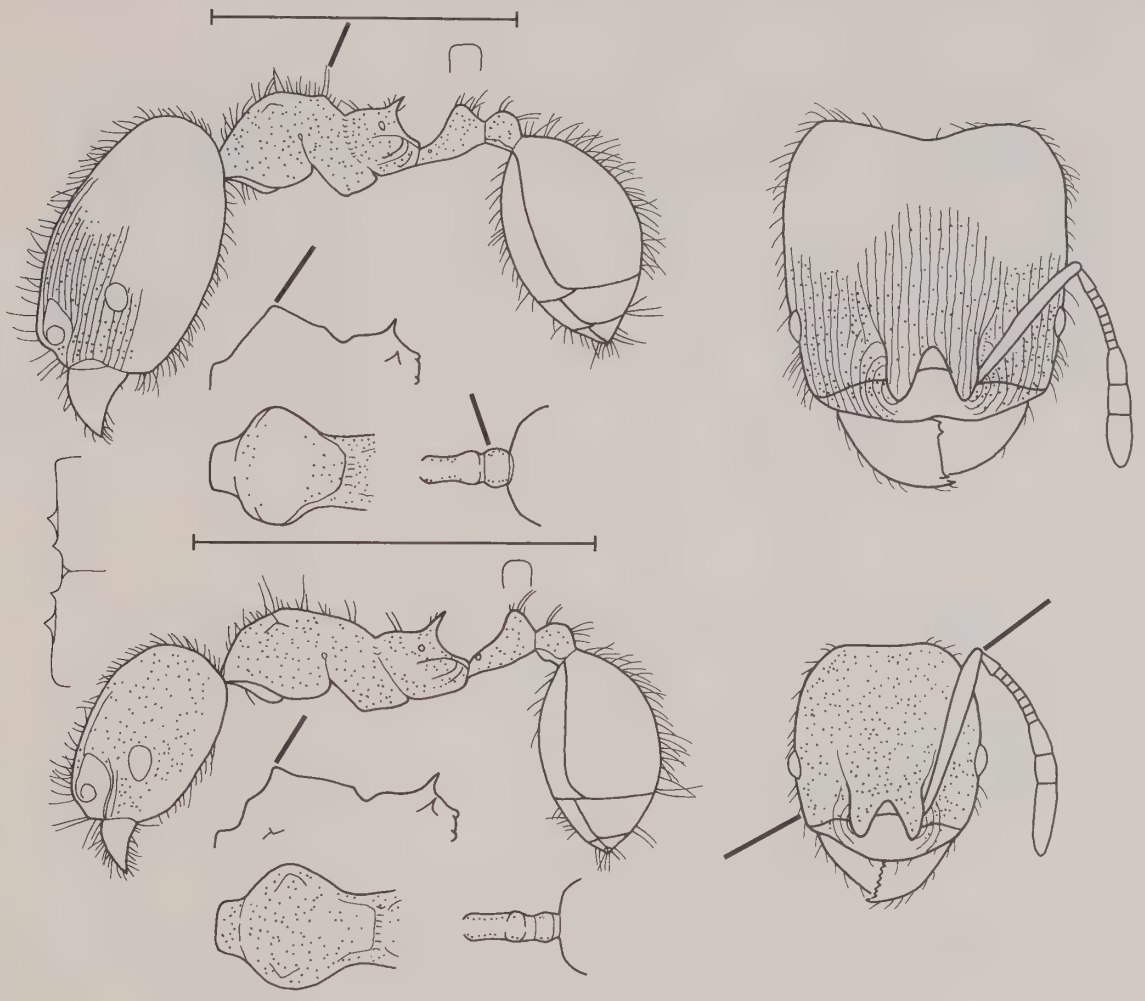


Pheidole casta Wheeler

Pheidole casta Wheeler 1908h: 454.

TYPES Mus. Comp. Zool. Harvard; Amer. Mus. Nat. Hist.
ETYMOLOGY Unknown.
DIAGNOSIS A medium-sized, yellow member of the *flavens* group, whose **major** is characterized by its elongate head, shallow antennal scrobes, exclusively carinulate cephalic structure, conulate postpetiole, and slightly contrasting brownish spot on the center of the dorsum of the head capsule.
Similar to *mera,* also of Texas, and distinguished from it by the less bulbous promesonotal profile in dorsal-oblique view, smooth occiput, and longitudinal (not oblique) orientation of the carinulae mesad to the eye.
MEASUREMENTS (mm) Lectotype major: HW 0.82, HL 1.14, SL 0.38, EL 0.14, PW 0.52.
Paralectotype minor: HW 0.42, HL 0.48, SL 0.34, EL 0.06, PW 0.26.
COLOR Major: concolorous yellow, with a circular patch of slightly contrasting brownish yellow in center of dorsum of head.
Minor: concolorous clear yellow.
RANGE Southern Texas. Specimens from Estado Mexico (km 127, Highway 57) in the Museum of Comparative Zoology appear to belong to this species, although they are darker in color than the types (brownish yellow), and the sides of the heads of the minors are smooth and shiny.
BIOLOGY *P. casta* is evidently a rare species. The type colony was found in a canyon of the Rio Grande, near Langtry, nesting in soil beneath cedars. The only other Texan record is from Cameron Co., about 20 km east of Brownsville (R. E. Gregg). The minor worker from this collection has the head and mesosomal dorsum completely foveolate.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: 17 km south of Puerto Viejo, Heredia Province, 10°18′N 84°02′W, 600 m (J. T. Longino). Scale bars = 1 mm.



Pheidole caulicola **new species**

TYPES INBio.

ETYMOLOGY L *caulicola,* stem-dwelling, alluding to the nest site.

DIAGNOSIS A medium-sized yellow species with cornulate humerus in both **major** and **minor**.

Close to *arhuaca,* but with more prominent humeri, shorter antennal scapes, and narrower, rounder postpetiolar node in both castes as well as smooth central pronotal dorsum in the **major**.

See also the somewhat less similar *sagana,* and further removed, *chalca, chalcoides, mincana, schmalzi,* and *tragica.*

MEASUREMENTS (mm) Holotype major: HW 0.74, HL 0.80, SL 0.40, EL 0.08, PW 0.42.

Paratype minor: HW 0.44, HL 0.50, SL 0.40, EL 0.06, PW 0.30.

COLOR Major: concolorous medium yellow.

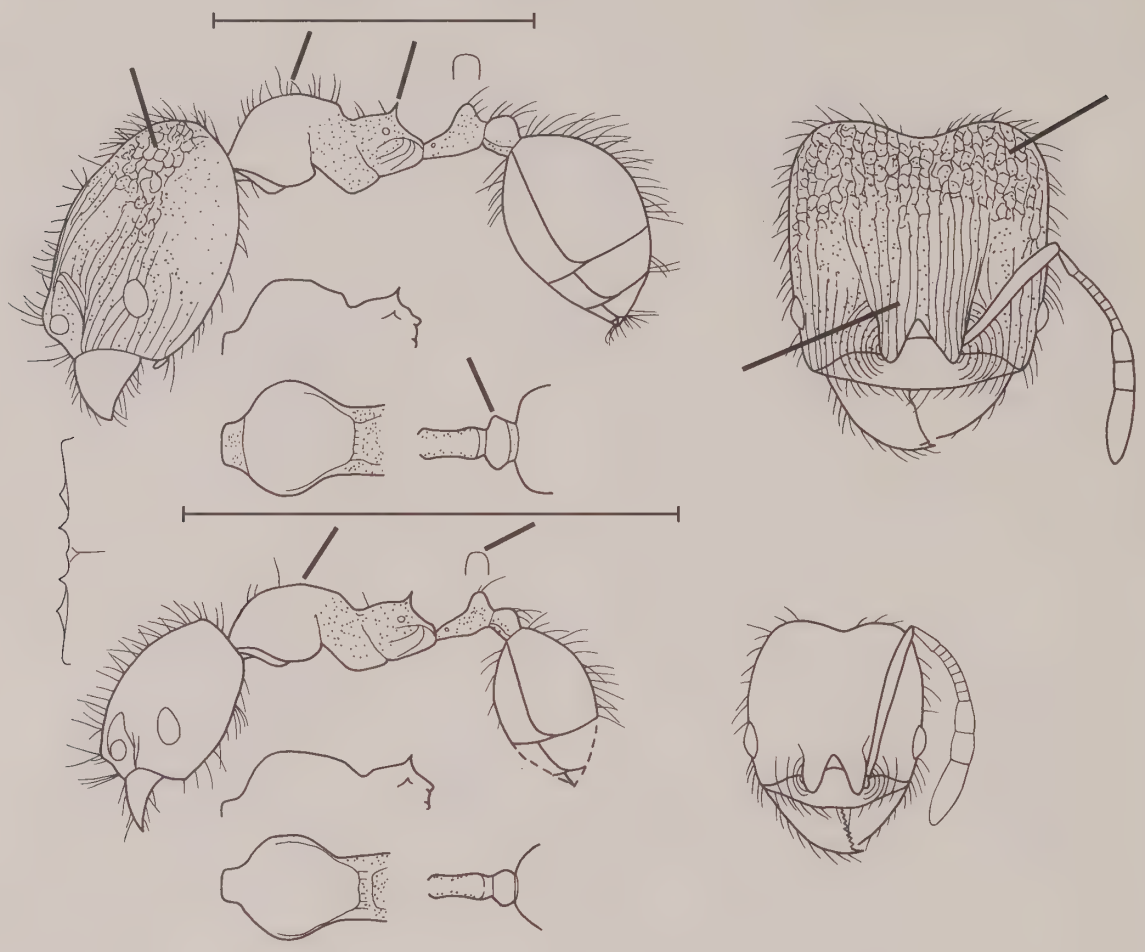
Minor: concolorous dark yellow.

RANGE Costa Rica, 500–600 m.

BIOLOGY "Braulio Carrillo National Park (500 m): mature wet forest. Canopy of *Licania* sp. Colony in dead stick. Rara Avis: fresh treefall in primary forest. In 4-mm-diameter dead stick." (J. T. Longino 1997.)

Compare with species listed
in the Diagnosis below

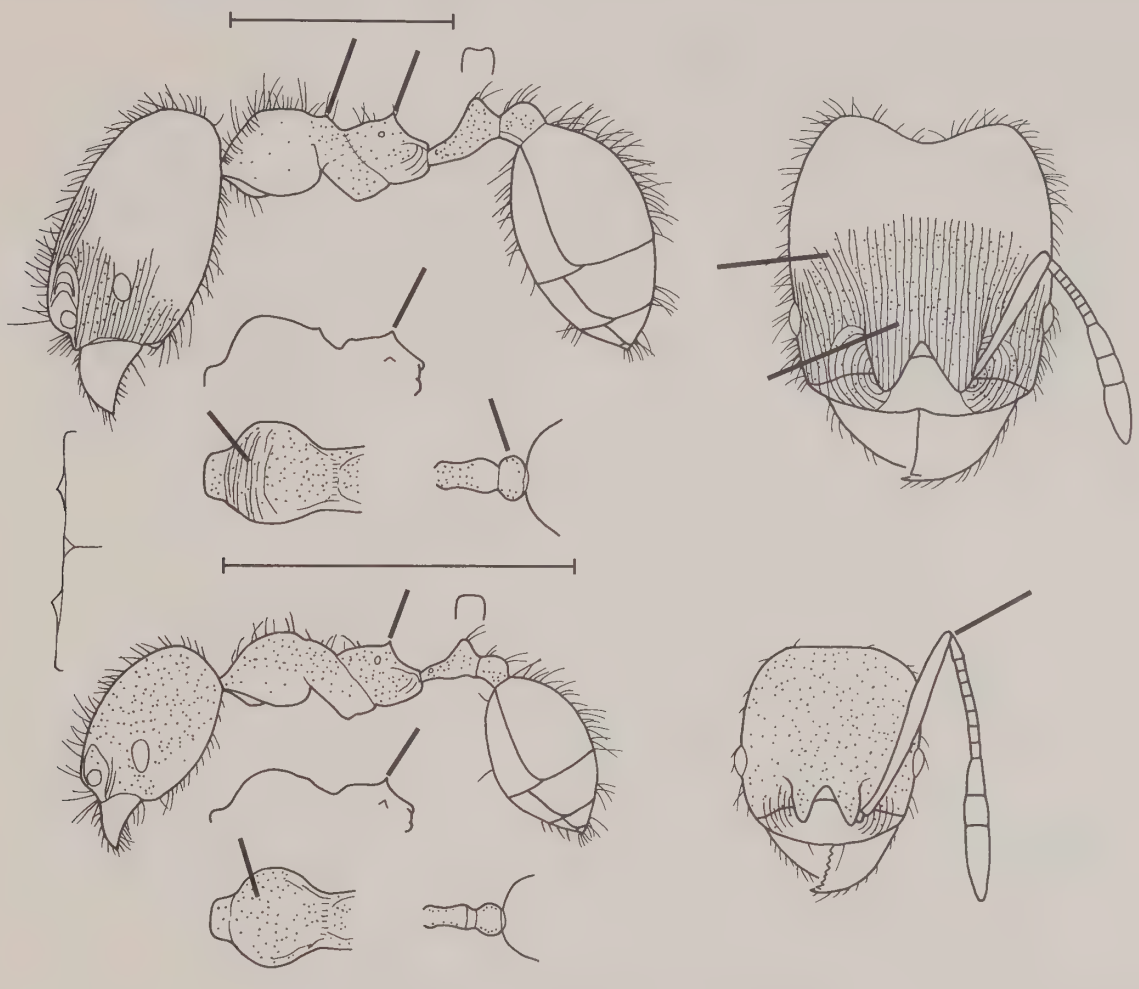
FIGURE Upper: holotype, major. Lower: paratype, minor. HONDURAS: 13 km south of La Ceiba, Atlántida Department, 130 m (W. L. Brown). Scale bars = 1 mm.



Pheidole ceibana **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Pertaining to Ceiba, near the type locality.
DIAGNOSIS Similar to *dentigula, harrisonfordi, lemnisca, metallescens, peltastes, perkinsi, renae, ruida, tayrona,* and *xyston,* differing as follows.
Major: very small; brown with pale yellow appendages; promesonotum smoothly semicircular in profile; heavily rugoreticulate occiput; and unstriped gaster.
Minor: head smooth, almost entirely sculpture-free.
MEASUREMENTS (mm) Holotype major: HW 0.64, HL 0.70, SL 0.38, EL 0.10, PW 0.34.
Paratype minor: HW 0.36, HL 0.40, SL 0.38, EL 0.08, PW 0.22.
COLOR Major and minor: body medium brown, appendages pale yellow.
RANGE Known only from the type locality.
BIOLOGY Collected from a piece of rotting wood on a steep, forested slope.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Rio Peñas Blancas, Alajuela, 10°19′N 84°43′W, 800 m (J. T. Longino). Scale bars = 1 mm.



Pheidole cerina **new species**

TYPES INBio.

ETYMOLOGY L *cerina,* wax-colored, yellowish, referring to the color.

DIAGNOSIS A relatively large species for the *flavens* group, with yellow to brown major and minor. Similar to *amabilis* of Costa Rica but differing in the **major** in the reduced propodeal spines, which point posteriorly (versus vertically in *amabilis*); in the well-developed mesonotal convexity, in the longer cephalic carinulae; in the more extensive carinulae of the pronotal dorsum; and in much longer antennal scapes of the **minor** (SL/HW 1.14, versus 1.0 in *amabilis*).

P. cerina, in the major mesonotal convexity and longer minor scapes, appears intermediate between the *flavens* and *punctatissima* groups.

See also the less similar *grex, mixteca,* and *morelosana.*

MEASUREMENTS (mm) Holotype major: HW 1.14, HL 1.74, SL 0.64, EL 0.16, PW 0.56.

Paratype minor: HW 0.44, HL 0.50, SL 0.50, EL 0.06, PW 0.30.

COLOR Major: body, mandibles, and antennae concolorous reddish yellow, legs medium yellow.

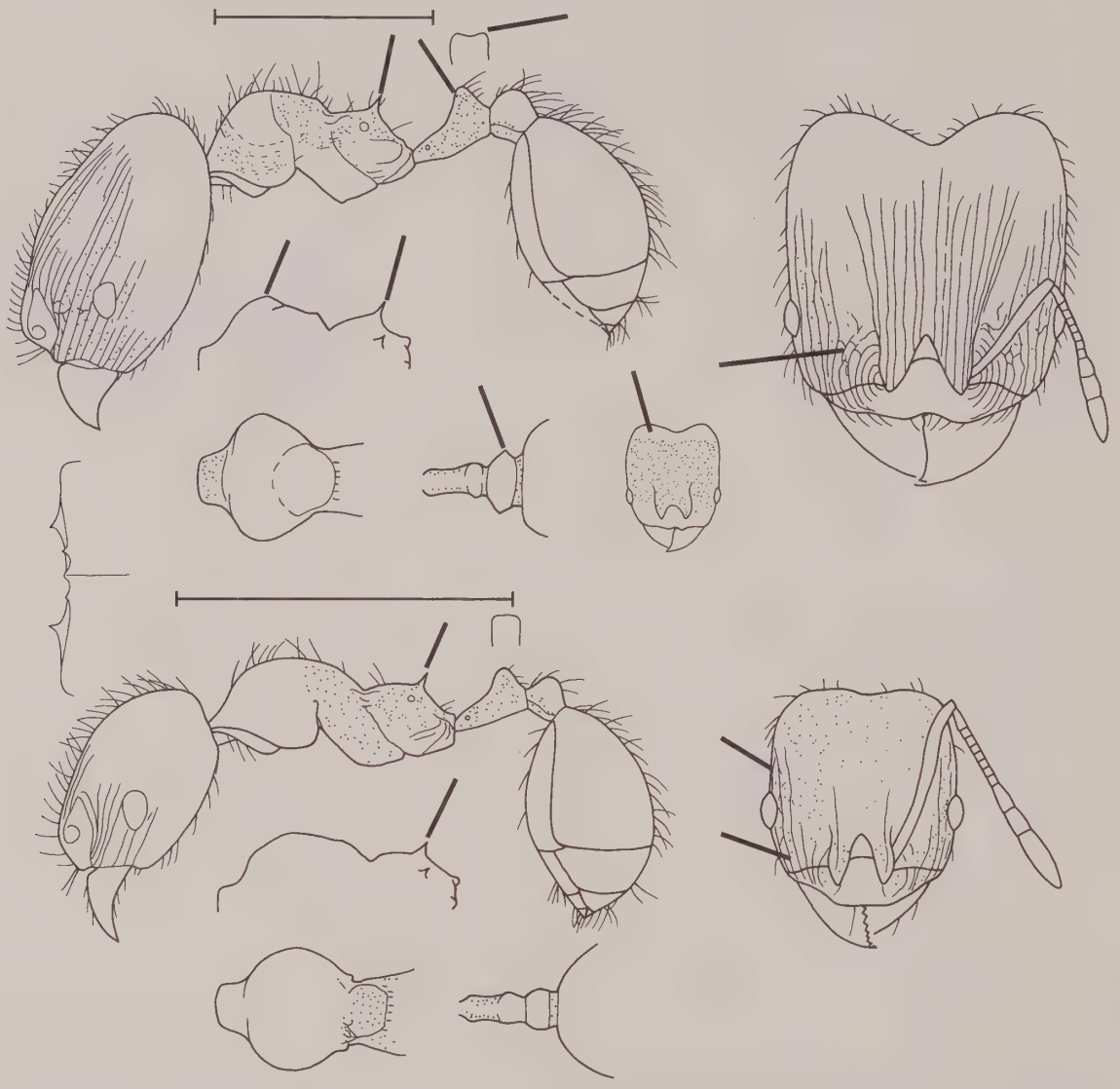
Minor: concolorous light-medium yellow. I have also seen two dark series from the type locality, with medium brown bodies and yellow appendages.

RANGE Known only from the type locality.

BIOLOGY Three series for which data are available come from litter samples taken in wet forest.

Compare with *chalcoides,* and
other species listed in the Diagnosis below

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. MEXICO: Molino Guerrero (Guerrero Mill), Hidalgo, 2600–2700 m (W. M. Mann). Scale bars = 1 mm.



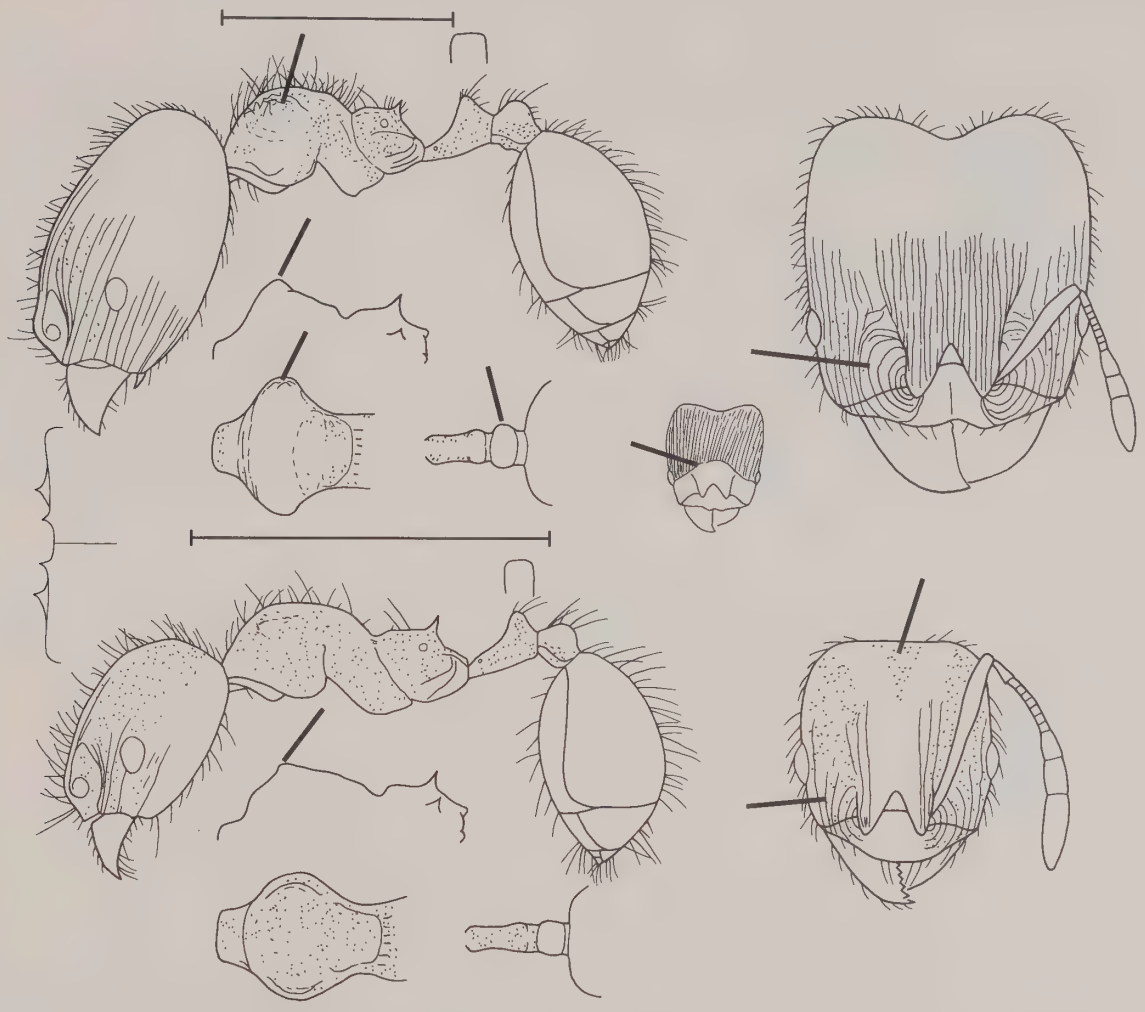
Pheidole chalca Wheeler

Pheidole chalca Wheeler 1914c: 44.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Presumably from Gr *chalkos,* copper, alluding to the body color.
DIAGNOSIS A small-medium species, with angulate postpetiole and bicolorous head in the **major**. Similar to *chalcoides,* but distinguished in the **major** by the smooth humerus, which is less prominent in dorsal-oblique view; broader, angular-sided postpetiolar node; and yellow occiput; and in the **minor** by the unarmed humerus and smooth pronotal dorsum.
Also similar but less so to *arhuaca, caulicola, mincana, sagana, schmalzi,* and *tragica,* differing in details of body shape, and sculpture as illustrated, and color.
MEASUREMENTS (mm) Lectotype major: HW 1.04, HL 1.24, SL 0.54, EL 0.14, PW 0.52.
Paralectotype minor: HW 0.52, HL 0.60, SL 0.50, EL 0.12, PW 0.38.
COLOR Major: anterior third of head and occiput yellow, remainder of head brown; body yellowish to light brown; appendages light yellow.
Minor: brownish yellow.
RANGE Hidalgo and Veracruz, Mexico.
BIOLOGY Mann (in Wheeler 1914c) found numerous small colonies in oak-pine woodland near Molino Guerrero, an ore mill on the eastern slope of the mountain range east of Pachuca; they were nesting under stones. I found a nest of several chambers about 15 cm below the surface in the dense clay soil of *Liquidambar* woods adjacent to a meadow at approximately 1700 m on the south slope of Pico Orizaba. Workers were foraging along an adjacent trail. Sexual pupae were in the nest on 23 August.

Compare with *chalca,* and other species listed in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: 3 km west of Fortin De Las Flores, Veracruz, 1000 m (R. J. Hamton and A. B. Hamton). Scale bars = 1 mm.



Pheidole chalcoides **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *chalcoides,* like *chalca,* a similar species.

DIAGNOSIS Medium-sized, bicolorous, similar to *chalca* of Hidalgo and Veracruz, distinguished in the **major** by the rugoreticulate humerus, which is also more prominently extended in dorsal-oblique view; by the narrower and laterally rounded postpetiolar node, and by the light brown (as opposed to yellow) occiput; and in the **minor** by the toothed humerus and foveolate, opaque pronotal dorsum.

Also similar but less so to *arhuaca, caulicola, mincana, sagana, schmalzi, tragica,* and *umphreyi,* differing in details of body shape, sculpture (especially mesosomal), and color.

MEASUREMENTS (mm) Holotype major: HW 0.98, HL 1.00, SL 0.48, EL 0.12, PW 0.50.

Paratype minor: HW 0.52, HL 0.56, SL 0.44, EL 0.08, PW 0.34.

COLOR Major: head weakly bicolorous, with anterior third of the capsule brownish yellow and the rear two-thirds light brown; mesosoma, waist, and appendages light to medium brown; gaster medium brown.

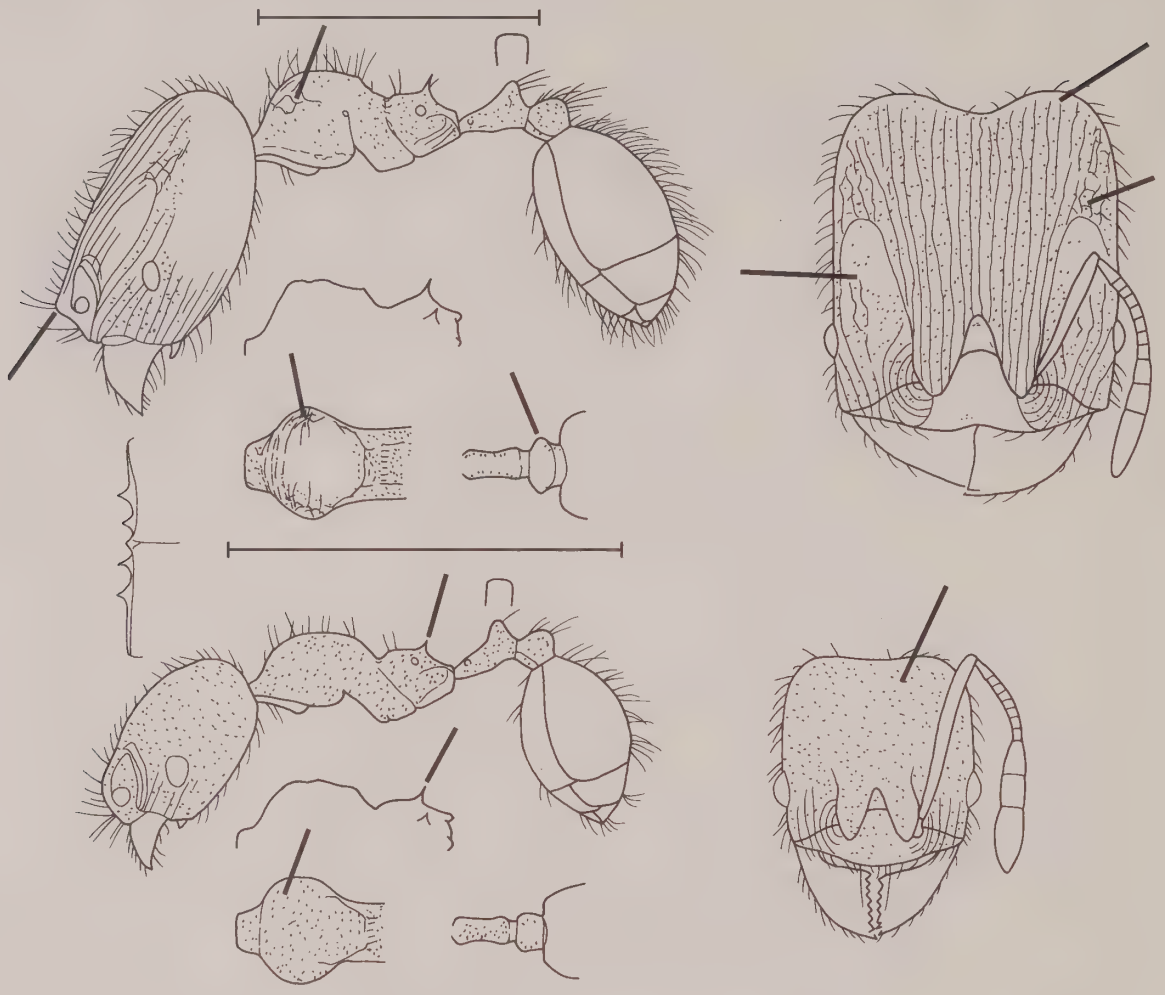
Minor: head, mesosoma, waist medium brown; gaster dark brown; appendages light brown.

RANGE Known from the type locality and a single series from Rio Palenque, Ecuador (Gary J. Umphrey).

BIOLOGY The Ecuador series was collected from a rotten section of a live tree, about 1.5 m above ground in forest.

Compare with *dumicola, floricola*

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Chipaque, Charaza Mun., Cundinamarca (W. L. Brown and I. De Polania). Scale bars = 1 mm.



Pheidole charazana **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the place of origin.

DIAGNOSIS A small, yellow member of the *flavens* group distinguished in the **major** by prominently projecting frontal lobes seen in side view, shallow antennal scrobes, somewhat elongate head, conulate postpetiolar nodes, and rugoreticulae at the ends of the scrobes and on the humeri.

MEASUREMENTS (mm) Holotype major: HW 0.68, HL 0.86, SL 0.38, EL 0.08, PW 0.40.
Paratype minor: HW 0.42, HL 0.46, SL 0.40, EL 0.08, PW 0.28.

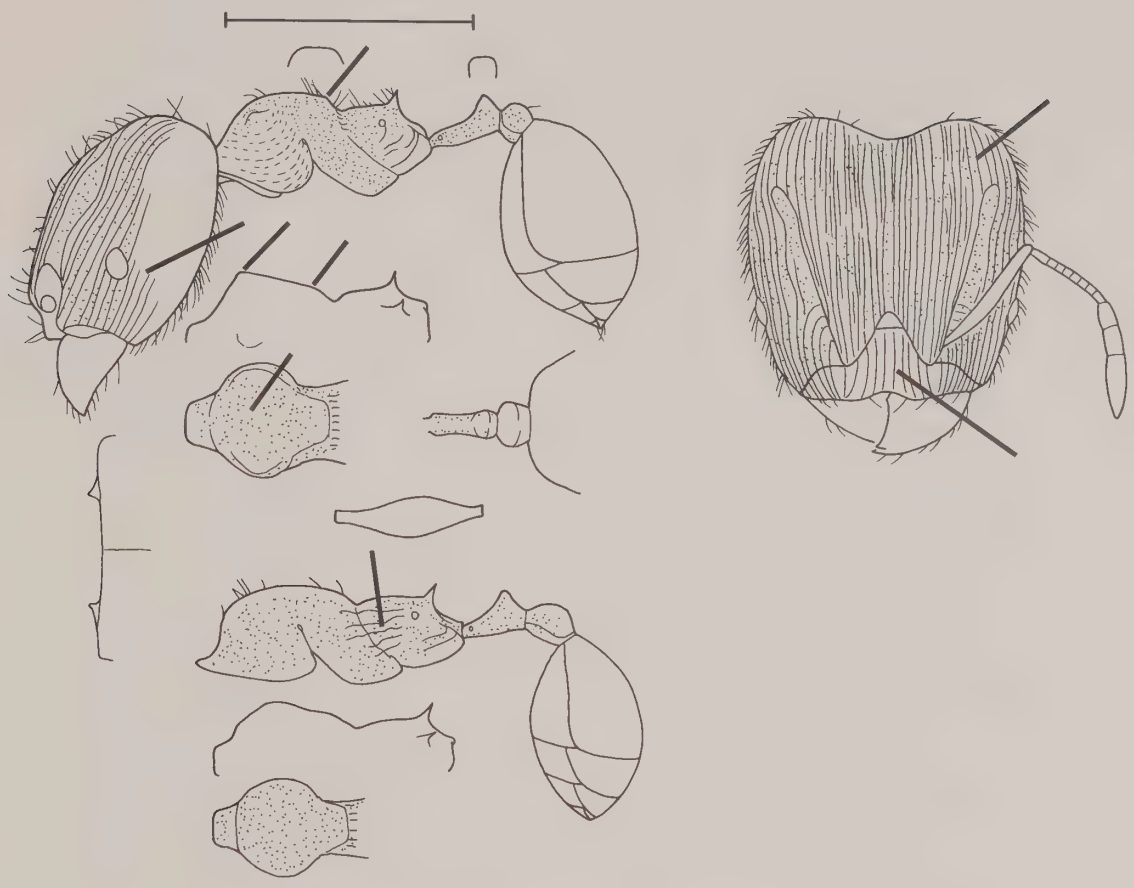
COLOR Major: body and mandibles dark yellow, legs medium yellow.
Minor: body dark yellow, mandibles and other appendages medium yellow.

RANGE Known only from the type series.

BIOLOGY The type series was collected from beneath a rock in a montane cultivated field.

Compare with *cardiella, goeldii, mittermeieri, nuculiceps, sculptior,* and especially *striaticeps*

FIGURE Upper: syntype, major. Lower: syntype, minor. COSTA RICA: La Caja, vicinity of San José, 1100 m (Paul Biolley). Scale bar = 1 mm.



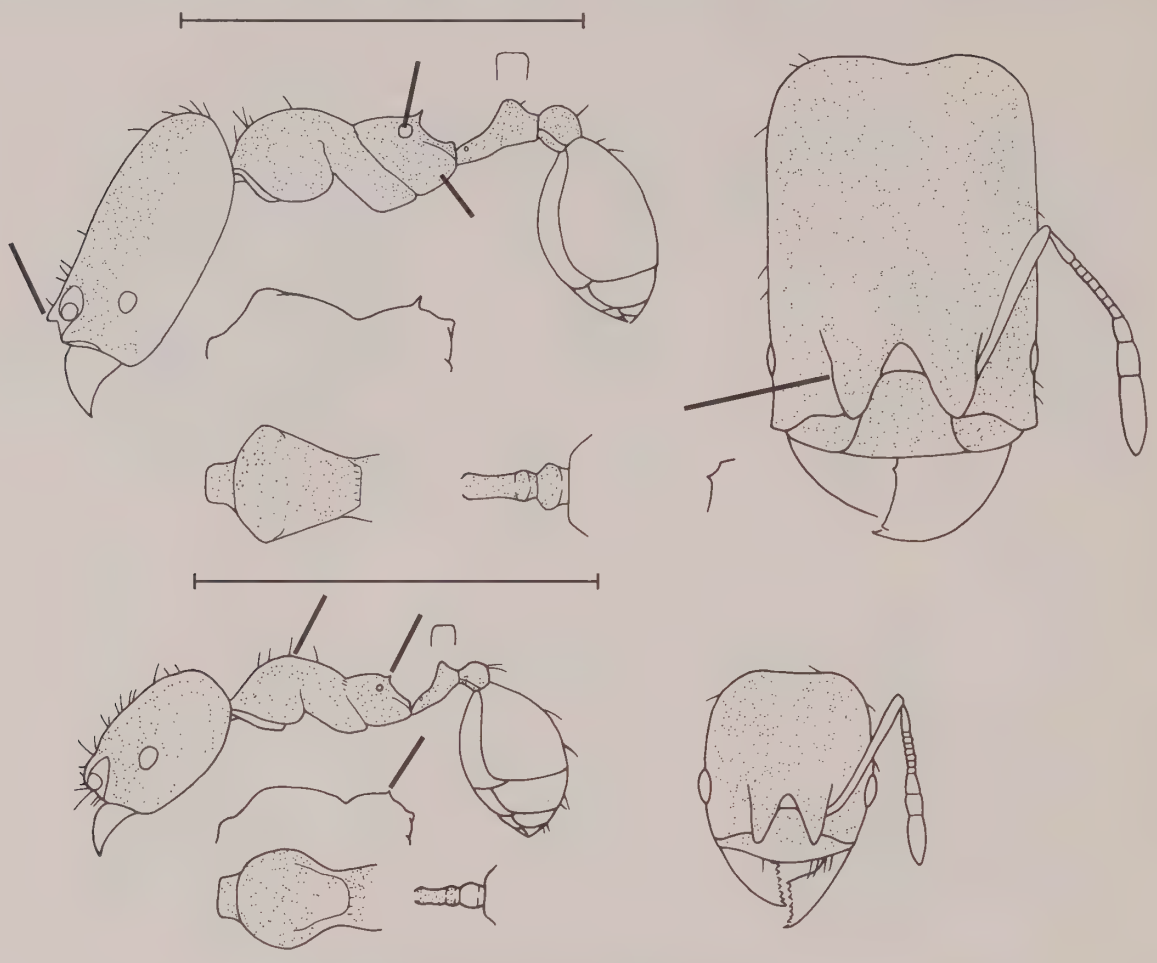
Pheidole chloe Forel, **new status**

Pheidole goeldii subsp. *chloe* Forel 1908c: 56.

TYPES Mus. Hist. Nat. Genève; Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *chloe,* first green shoots of plants in spring, allusion unknown.
DIAGNOSIS A member of the *flavens* group close to *striaticeps* of Mexico and Central America (and a possible synonym of it), much less so to the other species listed in the heading, and distinguished as follows.
Major: antennal scrobes present; entire dorsal surface of head, except for frontal triangle, covered by longitudinal carinulae, which do not curve inwardly toward midline at occiput; humerus subangulate in dorsal-oblique view; mesonotal convexity absent in both side and dorsal-oblique views; head wider than long (HW/HL 1.04); pronotum lacks transverse carinulae.
Minor: longitudinal carinulae stretch from mesopleuron to sides of propodeum.
MEASUREMENTS (mm) Syntype major: HW 1.00, HL 0.96, SL 0.56, EL 0.14, PW 0.50.
Syntype minor: PW 0.36 (head missing in syntype available).
COLOR Major: concolorous light reddish brown.
Minor: body brownish yellow (color of head unknown).
RANGE Costa Rica and Mexico. Longino (1997) does not distinguish this species from *striaticeps,* although the two appear to be different. He reports *"striaticeps,"* which may include both species, from the Atlantic slope to 500 m and Pacific lowlands of Costa Rica.
BIOLOGY Longino (1997) reports *"striaticeps,"* which as noted, may include both true *striaticeps* and *chloe,* from mature rainforest, nesting beneath the bark of rotten stumps and logs.

Compare with *exquisita, nigricula, nigella, pygmaea, sagittaria*

FIGURE Upper: syntype, major. Lower: syntype, minor. PANAMA. Scale bars = 1 mm.



Pheidole christopherseni Forel

Pheidole christopherseni Forel 1912g: 229.

TYPES Mus. Hist. Nat. Genève.

ETYMOLOGY Eponymous.

DIAGNOSIS One of the most distinctive of all *Pheidole* species, marked by extremely small size, greatly elongated head of the **major**, and almost complete lack of carinulae anywhere on the bodies of **major** and **minor**, even around the antennal fossae and on the metapleural gland bulla. In some series at least, **majors** have faint longitudinal carinulae on the frontal lobes, and both castes have a few such traces on sides of the head anterior to the eyes.

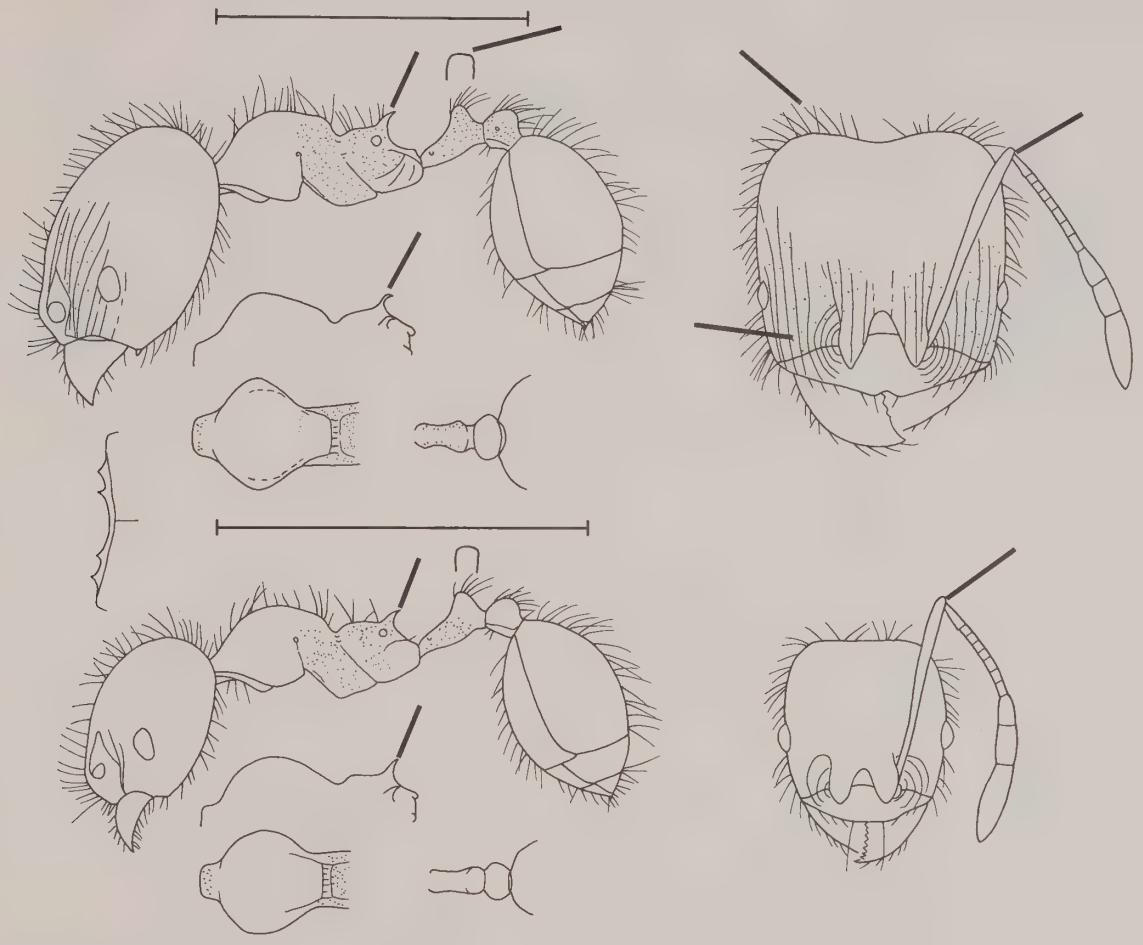
MEASUREMENTS (mm) Syntype major: HW 0.34, HL 0.40, SL 0.34, EL 0.06, PW 0.24.
Minor not measured.

COLOR Major: concolorous medium yellow.
Minor: concolorous pale yellow.

RANGE In addition to the type locality (Panama), Longino (1997) has recorded *christopherseni* from the Atlantic lowlands of Costa Rica and the Tayrona National Park of Colombia.

BIOLOGY In Costa Rica, *christopherseni* has been found in rainforest to 600 m, and in Colombia once in seasonal dry forest. This bizarre little species is strictly arboreal so far as is known. The type colony was nesting in a "very thin hollow stem" (Forel). Longino (1997) reports colonies from Costa Rica in the live, hollow stems of *Bauhinia* vines (a legume), as well as in a bignoniaceous liana, a small tree, and *Cecropia* saplings.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo (M. Byrne). Scale bars = 1 mm.

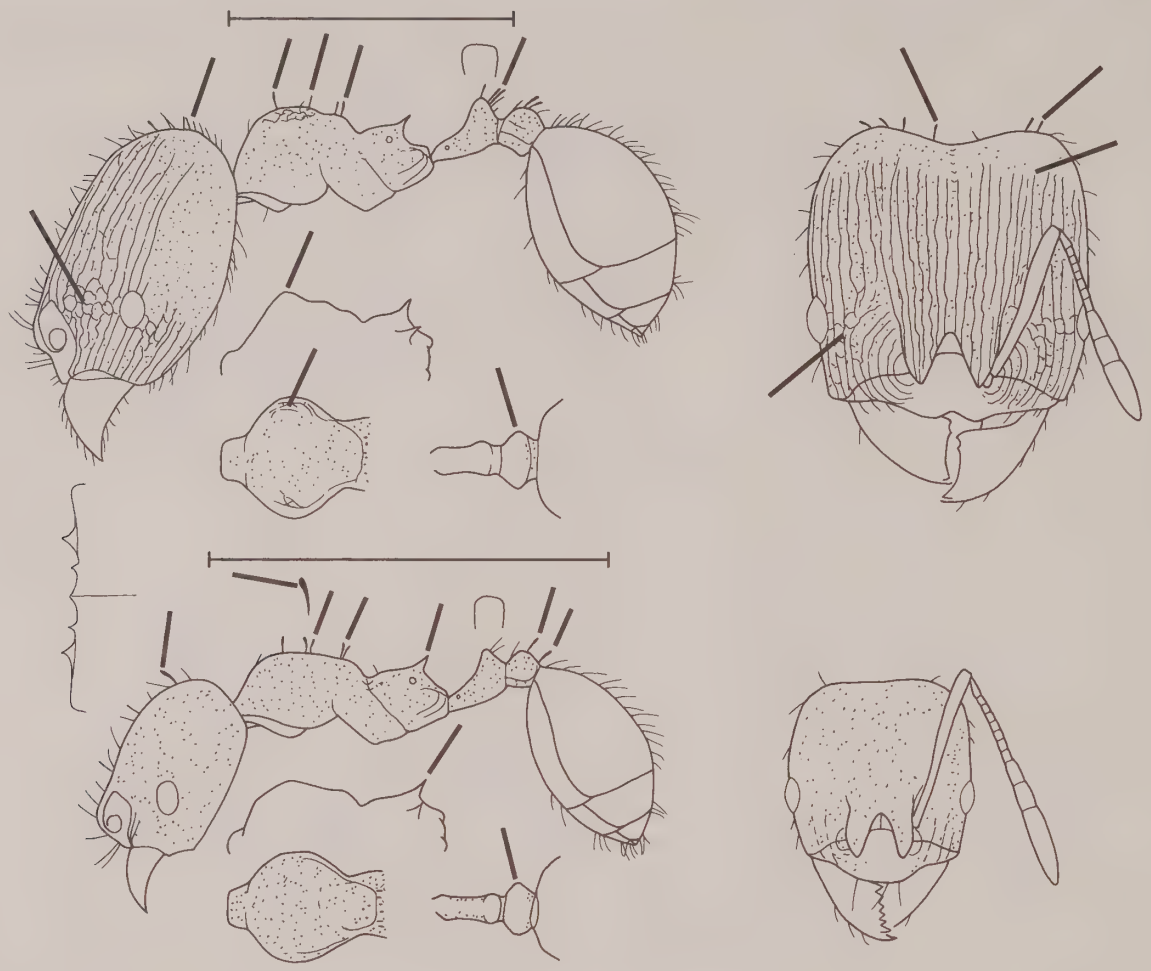


Pheidole citrina **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *citrina,* of citron, referring to yellow body color.
DIAGNOSIS A very small, yellow member of the *flavens* group whose **major** is marked by its strongly curved propodeal spine (as though the tip had "melted" backward); long scapes, which reach the occipital corners; all of the sculpturing on the anterior half of the head consisting of longitudinal carinulae, with the posterior half smooth and shiny; and pronotal humerus in dorsal-oblique view rounded. Similar to *onyx,* but in the **major**, *citrina* has a more curved propodeal spine, far less carinulation on the dorsal head surface, and longer scapes, among other differences.
See also the less similar *grex* and *humida*.
MEASUREMENTS (mm) Holotype major: HW 0.66, HL 0.70, SL 0.54, EL 0.06, PW 0.38.
Paratype minor: HW 0.46, HL 0.50, SL 0.54, EL 0.10, PW 0.28.
COLOR Major and minor: concolorous yellow.
RANGE Atlantic lowlands of Costa Rica (Longino 1997).
BIOLOGY Collected from leaf litter in wet forest.

Compare with *grex, humida, onyx*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. TEXAS: Austin (W. Wheeler). Scale bars = 1 mm.

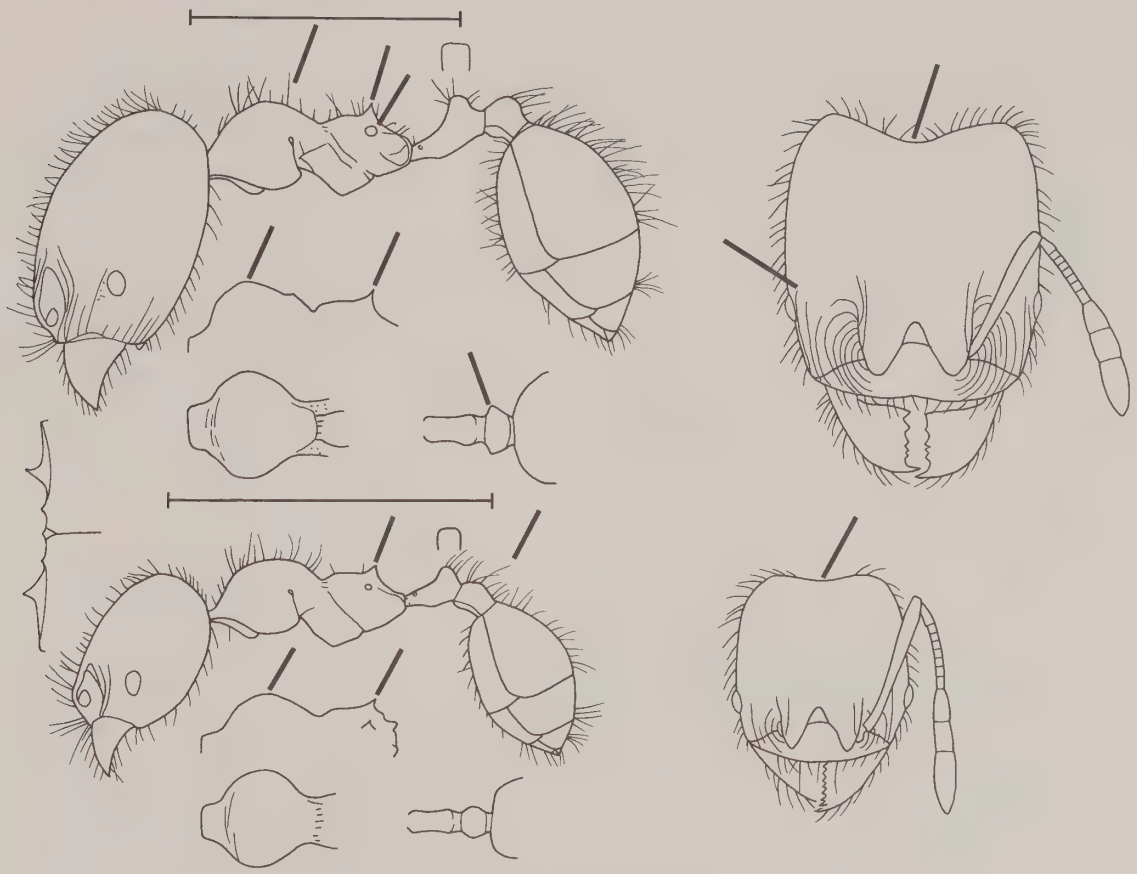


Pheidole constipata Wheeler

Pheidole constipata Wheeler 1908h: 468.

TYPES Mus. Comp. Zool. Harvard; Amer. Mus. Nat. Hist.
ETYMOLOGY L *constipata,* crowded or pressed together, allusion unknown, possibly to the compressed nature of the clavate hairs.
DIAGNOSIS An unusual member of the *flavens* group distinguished from other species of the genus as follows.
Major: yellow; mesosomal pilosity very sparse, consisting mostly of several clavate hairs; similar hairs present on occiput and waist; humerus raised slightly and subangulate; rugoreticula present between each eye and antennal fossa, and on the edges of the humeri; postpetiole from above elliptical.
Minor: mesosomal pilosity very sparse, consisting mostly of several clavate hairs; similar hairs present on occiput and waist; propodeal spines directed backward; postpetiole from above elliptical; head and mesosoma almost entirely foveolate.
MEASUREMENTS (mm) Lectotype major: HW 0.72, HL 0.80, SL 0.42, EL 0.12, PW 0.42.
Paralectotype minor: HW 0.44, HL 0.48, SL 0.42, EL 0.10, PW 0.30.
COLOR Major: concolorous reddish yellow.
Minor: mesosoma, waist, and appendages dark yellow; head and gaster yellowish brown.
RANGE Known only from the vicinity of Austin and New Braunfels, central Texas.
BIOLOGY The type series was taken from several colonies found under stones by Wheeler (1908h) at Austin and New Braunfels, Texas. In addition Stefan Cover (unpublished notes) found several colonies and colony fragments nesting under stones at Pedernales Falls State Park, Blanco Co., Texas, in juniper and juniper-oak-mesquite woodland. Winged males were found by W. M. Wheeler on 27 May 1903. This species, if truly local, may be threatened by the advance of dense populations of the red imported fire ant *(Solenopsis invicta)* into the Texas hill country. Cover found it only in areas not yet occupied by fire ant colonies.

FIGURE Upper: holotype, major. Lower: paratype, minor. ECUADOR: Sucua, 2°28′S 78°10′W (Gary J. Umphrey). Scale bars = 1 mm.

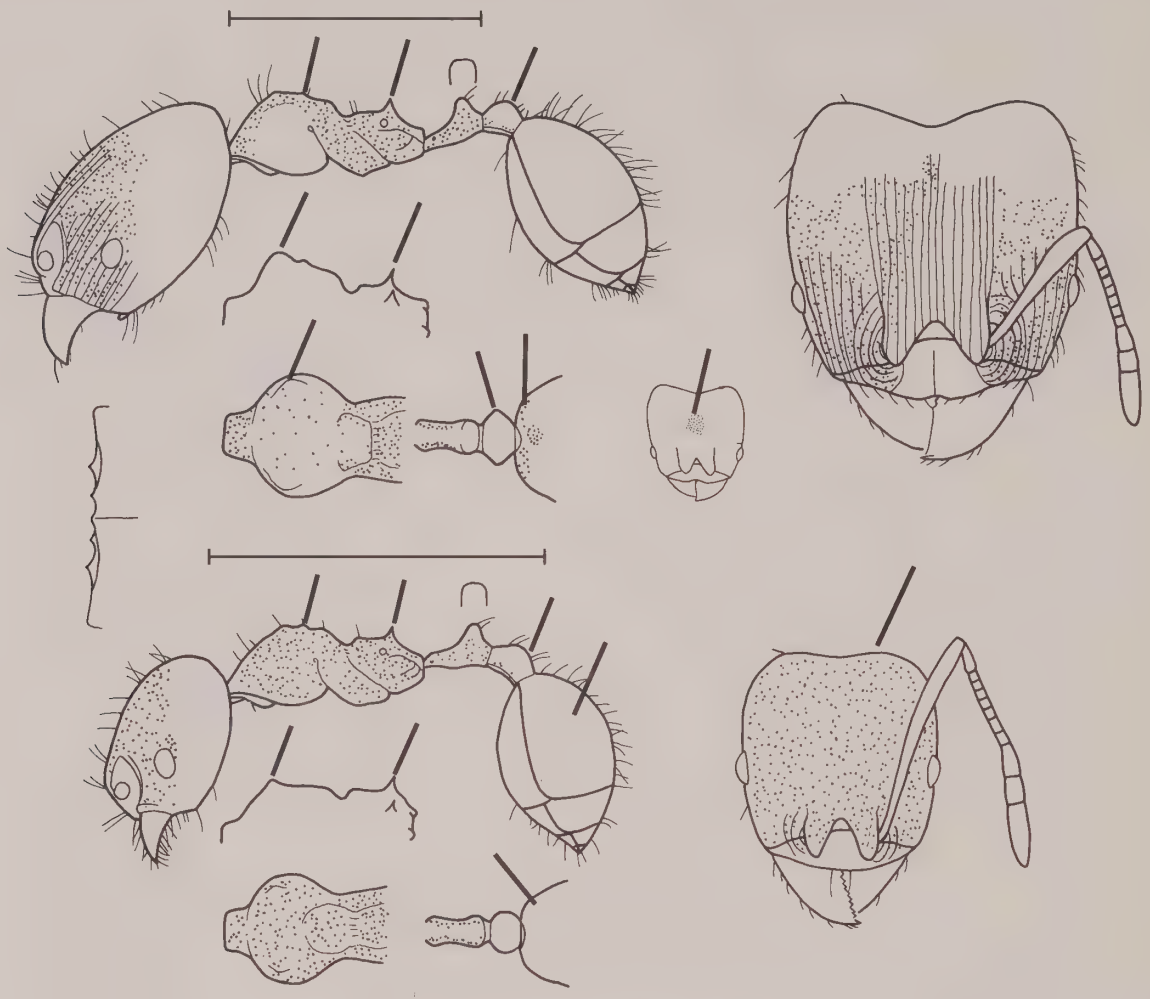


Pheidole crinita **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *crinita,* hairy.
DIAGNOSIS A small, yellow member of the *flavens* group distinguished in the **major** and **minor** by the complete absence of sculpturing posterior to the level of the eye, broadly concave occipital border, nearly perfect semicircular profile of the promesonotum, and abundant, long pilosity.
Major: nearly vertical propodeal spine in side view, exceptionally large propodeal spiracle, and laterally angulate postpetiolar node. Similar to *amabilis, boliviana, melastomae, mixteca, scitula,* and especially *terresi* of Hispaniola and *tysoni* of the eastern United States.
MEASUREMENTS (mm) Holotype major: HW 0.76, HL 0.88, SL 0.42, EL 0.06, PW 0.40.
Paratype minor: HW 0.44, HL 0.50, SL 0.40, EL 0.04, PW 0.32.
COLOR Major: clear medium yellow.
Minor: clear medium to pale yellow.
RANGE Known only from the type series.
BIOLOGY The type colony was found in a buried piece of rotting wood.

Compare with *bilimeki, floridana, punctatissima, stomachosa*

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia, 50–150 m (J. T. Longino). Scale bars = 1 mm.



Pheidole daphne **new species**

TYPES INBio.

ETYMOLOGY Named after Daphne, the nymph in classical mythology who was changed into a laurel tree (reference to the arboricolous habits of the species).

DIAGNOSIS A medium-sized, distinctively bicolorous member of the *flavens* group, similar to the widespread species *bilimeki,* differing in the **major** by the laterally angulate (as opposed to spinose) postpetiolar node, limited shagreening on the first gastral tergite, and color (see below); and in the **minor** by the completely smooth and shiny first gastral tergite.

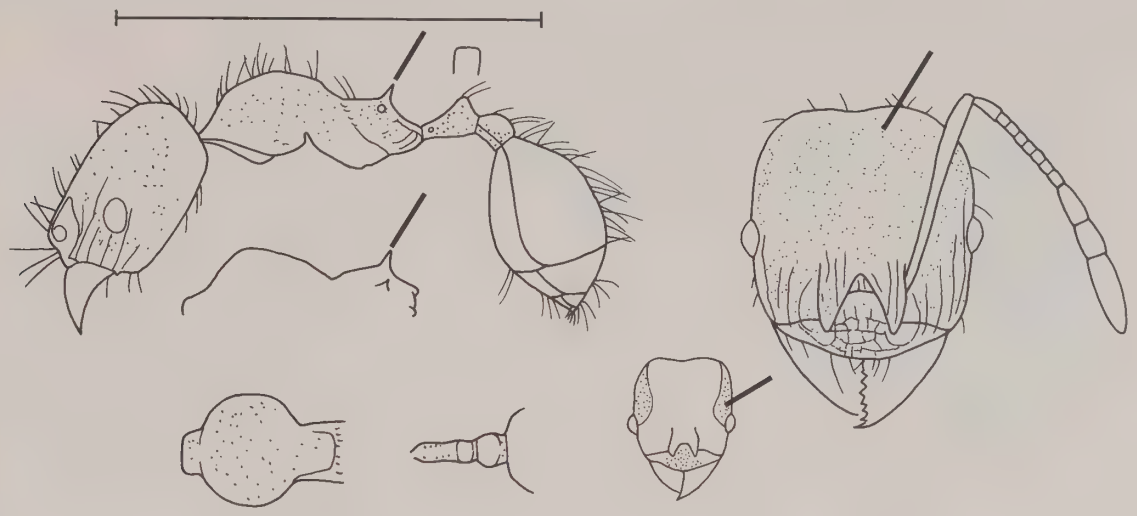
MEASUREMENTS (mm) Holotype major: HW 0.90, HL 0.90, SL 0.50, EL 0.12, PW 0.42.
Paratype minor: HW 0.46, HL 0.56, SL 0.46, EL 0.08, PW 0.30.

COLOR Major: head and appendages clear medium yellow, except for an ill-defined light brown circular spot in center of head capsule dorsum; rest of body (mesosoma, waist, gaster) light brown.
Minor: head and gaster light brown, rest of body and appendages medium to dark yellow.

RANGE The Atlantic lowlands of Costa Rica (Longino 1997).

BIOLOGY Colonies of *daphne* are arboricolous, and as such have been collected by insecticidal fogging and Malaise trapping in lowland rainforest (Longino 1997).

FIGURE Syntype, minor. HAITI: Massif de la Hotte (P. J. Darlington). Major: unknown. Scale bar = 1 mm.



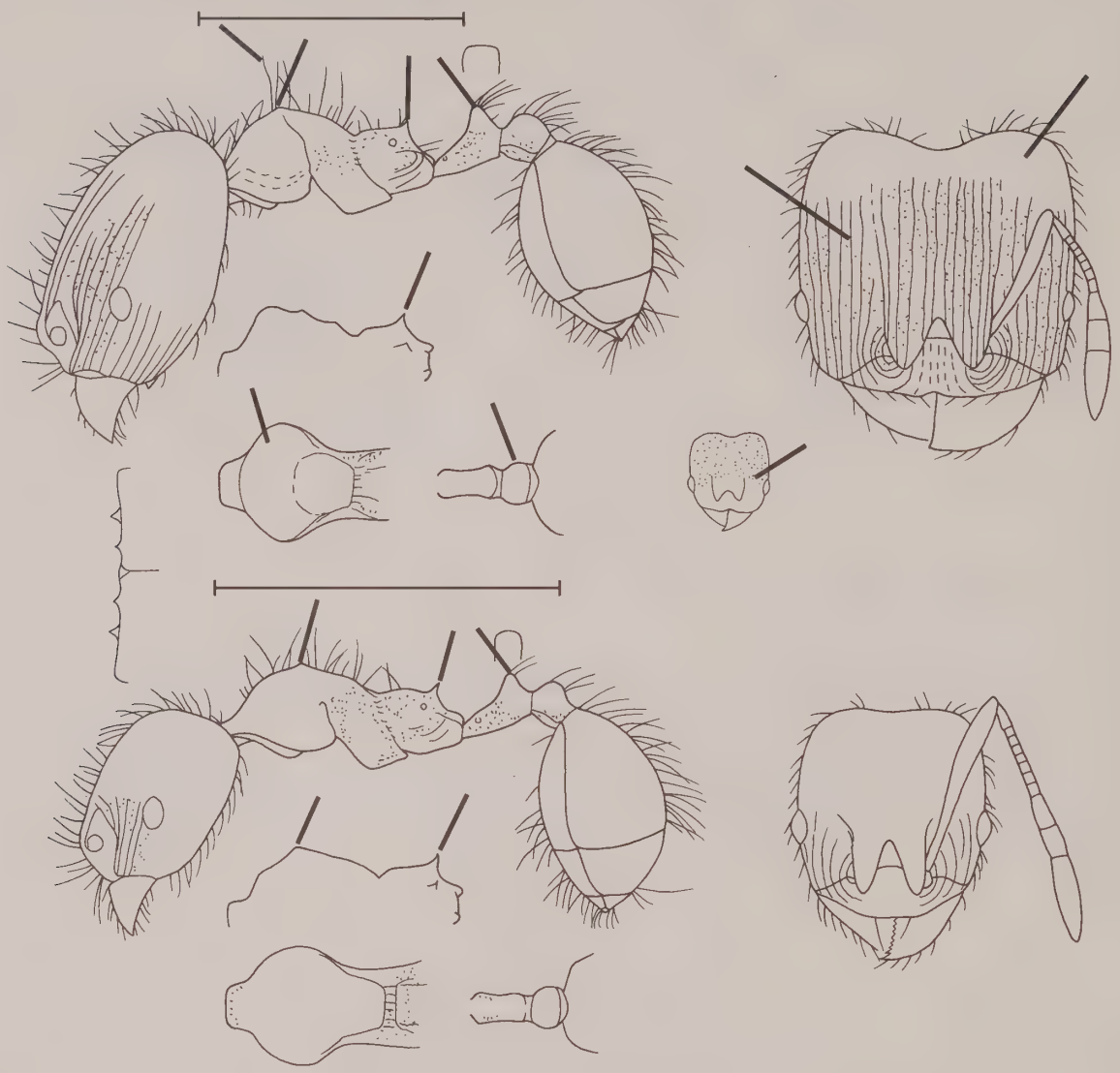
Pheidole darlingtoni Wheeler

Pheidole darlingtoni Wheeler 1936c: 198.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the collector, the distinguished coleopterist and biogeographer Philip J. Darlington.
DIAGNOSIS Known only from the **minor**, which is readily distinguished by its unique coloration (see Color below), moderate-sized propodeal spines, and mostly foveolate head and mesosoma.
MEASUREMENTS (mm) Syntype minor: HW 0.32, HL 0.48, SL 0.42, EL 0.06, PW 0.28.
COLOR Minor: bicolored; mostly pale, whitish yellow, with light brown postpetiole, gaster, portions of head as shown, and scapes.
RANGE Evidently an endemic of Haiti; it may possibly also turn up in the Dominican Republic when mountain habitats are better collected.
BIOLOGY Unknown.

Compare with *chalca, lucaris, ulothrix*

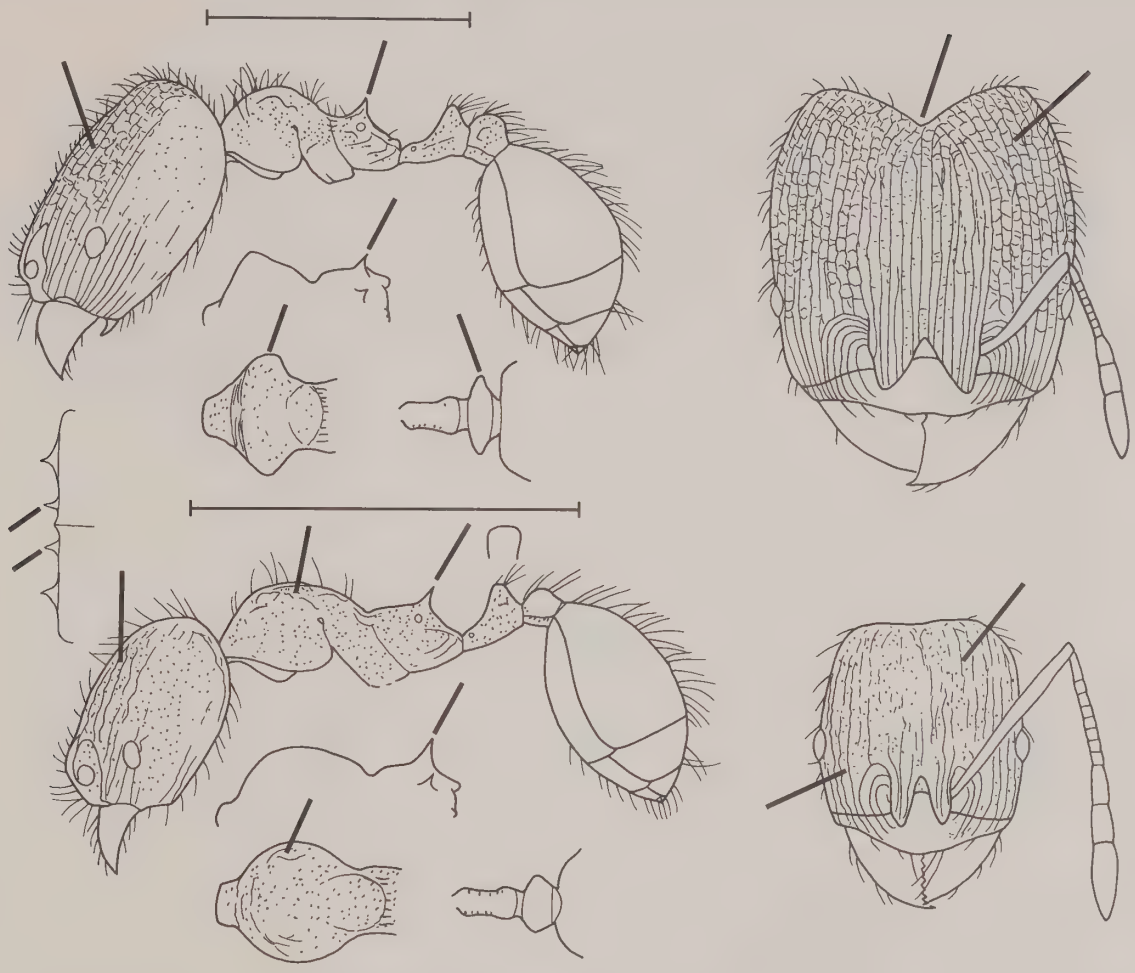
FIGURE Upper: holotype, major. Lower: paratype, minor. BOLIVIA: Aserrodero Moira, Santa Cruz, 14°34′S 61°12′W (Philip S. Ward). Scale bars = 1 mm.



Pheidole delicata **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *delicata,* delicate, dainty.
DIAGNOSIS A medium-sized, mostly dark brown member of the *flavens* group whose **major** has a bicolored head and mesosoma; long, erect hairs on the promesonotum; propodeal spine reduced almost to a denticle; the petiolar node apex narrow; postpetiole seen from above oval; longitudinal carinulae covering almost all of the head, including the central part of the clypeus (but not the occiput, which is smooth); and mesosoma almost entirely smooth and shiny.
Similar in some but not all of these traits to *chalca, lucaris,* and *ulothrix,* differing in additional details of body form, sculpturing, pilosity and color, as variously described above and illustrated.
MEASUREMENTS (mm) Holotype major: HW 1.00, HL 1.00, SL 0.56, EL 0.14, PW 0.44.
Paratype minor: HW 0.60, HL 0.62, SL 0.52, EL 0.12, PW 0.40.
COLOR Major and minor: head anterior to the level of the eyes and sides of the prothorax and mesothorax brownish yellow; appendages light brown.
RANGE Known only from the type series.
BIOLOGY Unknown.

FIGURE Upper: paratype, major. Lower: paratype, minor. MISSISSIPPI: State University, near Starkville, Oktibbeha Co. (M. R. Smith). Scale bars = 1 mm.



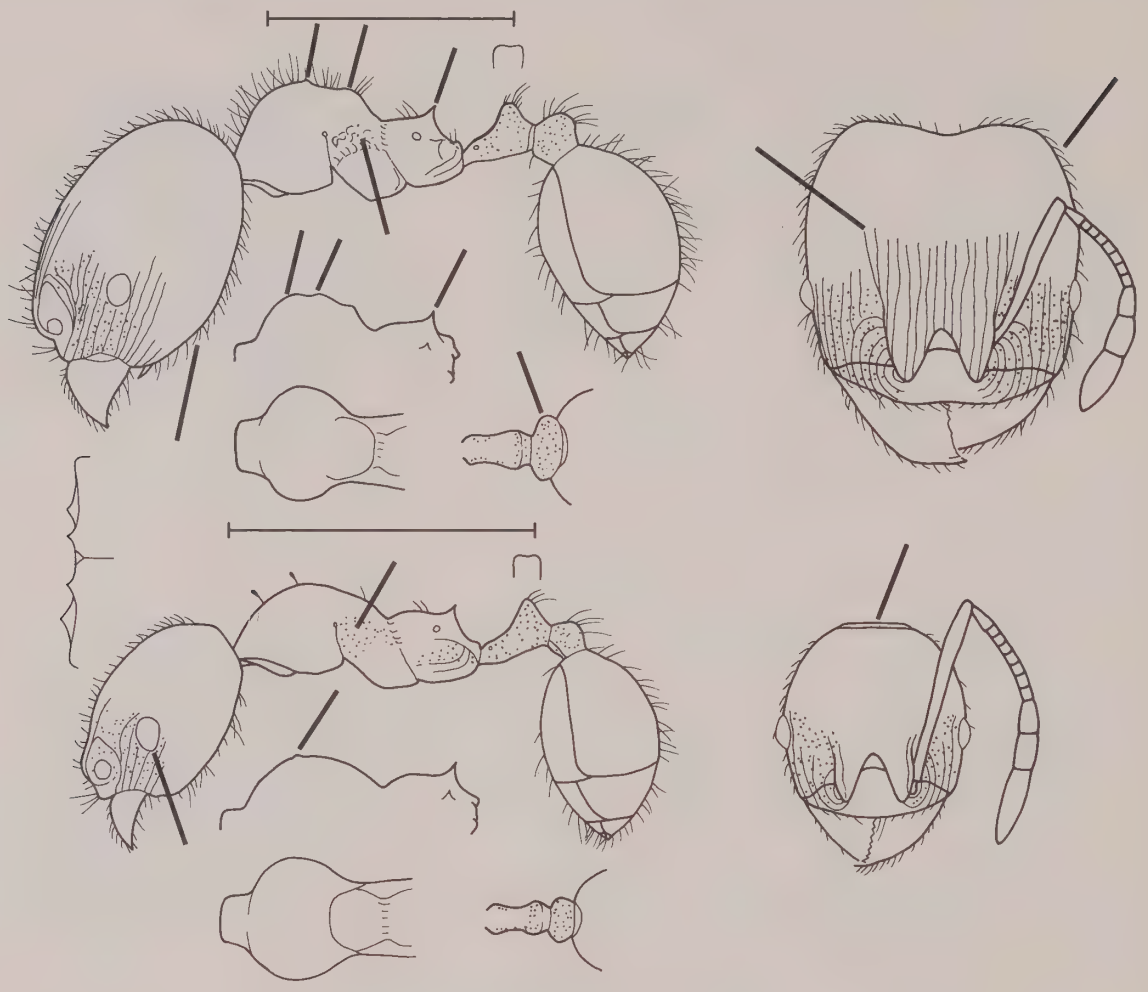
Pheidole dentigula M. R. Smith

Pheidole dentigula M. R. Smith 1927b: 310.

TYPES Nat. Mus. Nat. Hist. U. S.; Mus. Comp. Zool. Harvard.
ETYMOLOGY L *dentigula,* toothed throat (gula), referring to the strong teeth of the hypostoma in the type majors.
DIAGNOSIS Similar to *ceibana, lignicola, metallescens,* and *saucensis,* differing as follows.
Major: frontal lobes and vertex carinulate; all of rest of dorsal head surface from eyes to occiput rugoreticulate; occipital cleft deep, its nadir angulate; inner teeth of hypostoma unusually prominent (projecting well forward of anterior head margin in side view); propodeal spines large, robust, equilaterally triangular; postpetiole from above very broad, elliptical.
Minor: space between eye and antennal fossa on each side rugulose, and most of rest of head, including occiput, carinulate; the carinulae are quite variably developed, and often weak even though still present (the figure represents one extreme); all of head and mesosoma except for midclypeus foveolate; anterior and lateral margins of pronotal dorsum rugulose; propodeal spines large, thick at base.
MEASUREMENTS (mm) Paratype major: HW 0.84, HL 0.94, SL 0.40, EL 0.10, PW 0.44.
Paratype minor: HW 0.46, HL 0.52, SL 0.42, EL 0.06, PW 0.30.
COLOR Major: body and mandibles concolorous reddish brown; appendages dark yellow.
Minor: head, mandibles, and mesosoma light reddish brown; waist, gaster, and other appendages dark yellow.
RANGE Tennessee and North Carolina south to the Florida Keys and west to eastern Texas, mostly on the coastal plain.
BIOLOGY According to Marion R. Smith (1944d), *dentigula* occurs in forests, where it nests in the soil and in rotten stumps. Stefan Cover (personal communication) adds that "*P. dentigula* is definitely a forest ant. In moist or mesic forest types it is common in soil and rotten wood. In xeric types, like longleaf pine-turkey oak sandhill forest, it is found in moisture-retentive microhabitats like large rotten stumps, or under deep litter in small depressions." W. L. Brown and I found winged reproductives in a colony near Ravenel, South Carolina, on 9 June 1957.

Compare with *alacris, atticola, hazenae, lucaris, ulothrix*

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: 10 km east of Campo Grande, Mato Grosso do Sul (Carlos Roberto F. Brandão). Scale bars = 1 mm.



Pheidole dinophila **new species**

TYPES Mus. Comp. Zool. Harvard; Mus. Zool. Univ. São Paulo.

ETYMOLOGY Gr *dinophila,* lover (friend) of the terrible, referring to communal life with the giant ant *Dinoponera*.

DIAGNOSIS Similar in various traits to the species listed in the heading above, differing as follows.

Major: central portion of the lateral strip of mesopleuron covered by broken rugulae; remainder of mesopleuron and entire posterior half of head entirely smooth and shiny; pronotum with small convexity visible above its dorsal profile in side view; mesonotal convexity present; pilosity of head dense, short, and of nearly uniform length, in comparison with pilosity on remainder of body; propodeal spines vary from reduced and denticulate to equilaterally triangular; postpetiole from above elliptical.

Minor: mesosomal pilosity very sparse, with hairs on the pronotal dorsum spatulate; eyes large; occiput narrowed, with a thin nuchal collar; humerus in dorsal-oblique view denticulate; a strip across middle of mesopleuron foveolate, and remainder of mesosoma smooth and shiny.

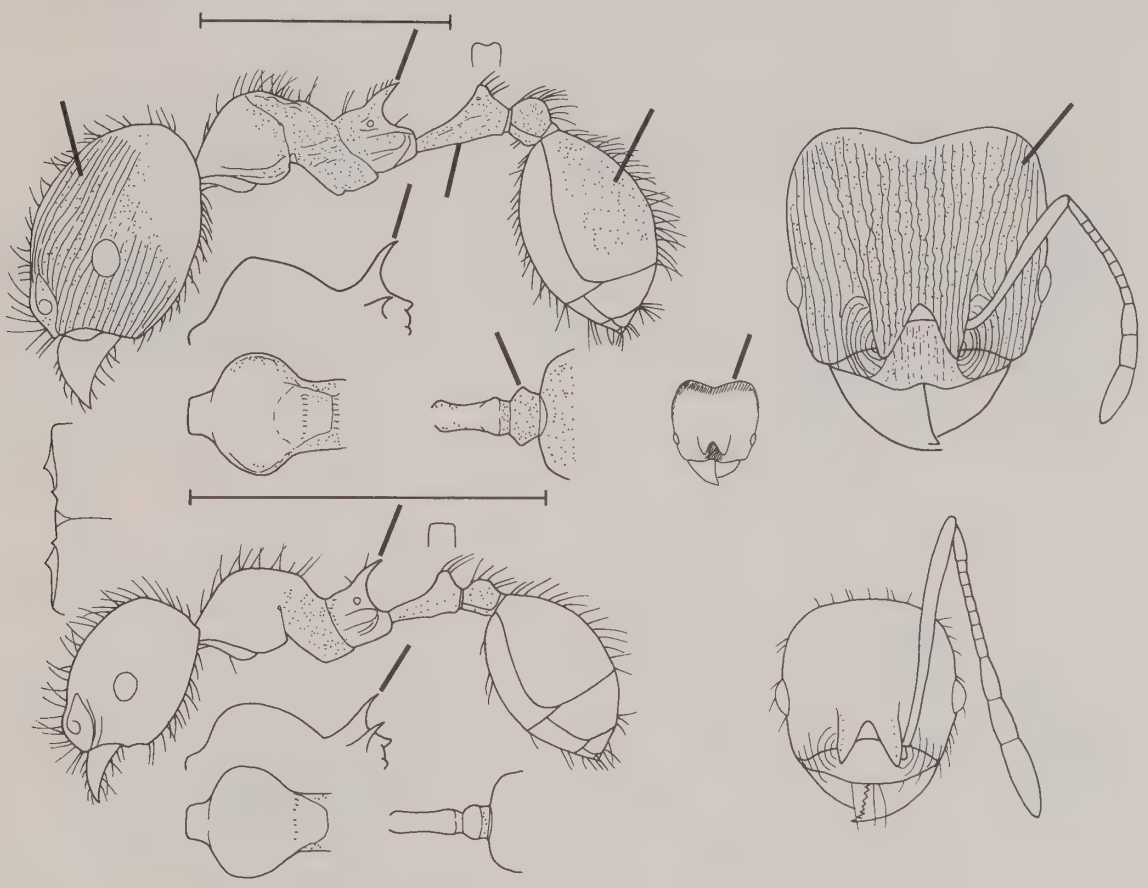
MEASUREMENTS (mm) Holotype major: HW 1.00, HL 1.04, SL 0.64, EL 0.16, PW 0.50.
Paratype minor: HW 0.60, HL 0.64, SL 0.58, EL 0.10, PW 0.38.

COLOR Major: body dark reddish brown; appendages medium reddish brown except for light reddish brown antennae and tarsi.
Minor: body medium reddish brown, appendages light reddish brown.

RANGE *P. dinophila* has been collected in the type locality (Mato Grosso do Sul) and far to the east, at Itirapina, near Rio Claro, São Paulo. Another series from Niquelândia, Goiás, has been tentatively placed in *dinophila,* but differs from the types by the more extensive sculpture and longer propodeal spines of the major and by the absence of spatulate hairs in the minor; and thus may prove to be a distinct species.

BIOLOGY All of the series at Itirapina and the one at Campo Grande were collected in nests of the giant ponerine ant *Dinoponera australis* by Ricardo V. S. Paiva and C. Roberto F. Brandão (Paiva, personal communication).

FIGURE Upper: holotype, major. Lower: paratype, minor. DOMINICAN REPUBLIC (GREATER ANTILLES): Sierra de Baoruco, N. Cabo Rojo, Km 23, near Pedernales, 500 m (William L. and Doris E. Brown). Scale bars = 1 mm.



Pheidole drepanon **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *drepanon,* sickle, alluding to the propodeal spines.

DIAGNOSIS Similar to the Dominican endemic *harlequina,* differing from it and all other *Pheidole* as follows.

Major: propodeal spines very thick, curved, sickle-shaped, and much longer than the propodeal basal face anterior to them; head and body bicolored as depicted; all of dorsal surface of head except for occipital margin carinulate and weakly rugulose; head slightly broader than long; petiolar peduncle very long; postpetiole from above diamond-shaped.

Minor: propodeal spines very thick, curved, and sickle-shaped, much longer than the propodeal basal face anterior to them; body concolorous medium brown.

MEASUREMENTS (mm) Holotype major: HW 1.04, HL 1.02, SL 0.70, EL 0.14, PW 0.50.
Paratype minor: HW 0.48, HL 0.52, SL 0.64, EL 0.08, PW 0.32.

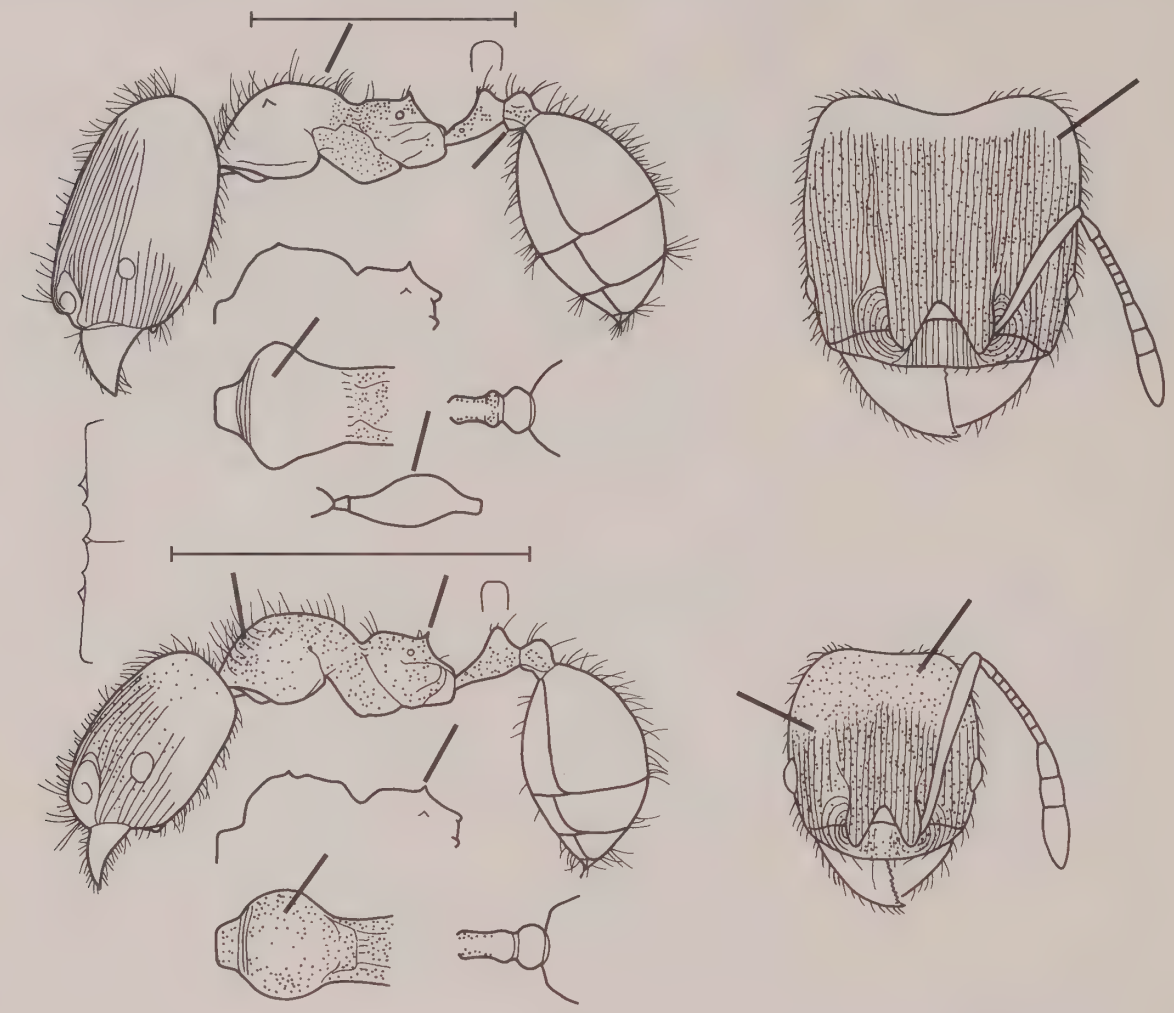
COLOR Major: body medium brown except for the front of the head (as depicted), as well as dorsum of promesonotum and anterior half of first gastral tergite, which are brownish yellow.
Minor: body concolorous medium brown, appendages light to yellowish brown.

RANGE *P. drepanon* is evidently an endemic of the Dominican Republic; a second collection was made by P. S. Ward 22 km north of Pedernales, 18°09′N 71°35′W, 1600 m. *P. drepanon* might also occur in Haiti, especially since the type locality is close to the border.

BIOLOGY The type colony was collected in tropical evergreen forest.

Compare with *erratilis, nitella, pygmaea*

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Braulio Carrillo National Park, Heredia, 500 m (J. T. Longino). Scale bars = 1 mm.



Pheidole dryas **new species**

TYPES INBio.

ETYMOLOGY L, Gr *Dryas,* in classical mythology, a wood nymph whose life was that of her tree, referring to the arboricolous nesting habit of the species.

DIAGNOSIS A unique medium-sized, yellowish brown species whose **major** has a heart-shaped head, when mandibles are included, in full-face view; all of the dorsal head surface, including the clypeus but excluding the occiput, densely covered by longitudinal carinulae; conspicuously swollen hind femur; and angulate subpostpetiolar process.

There is some similarity to *erratilis, nitella,* and *pygmaea,* but many differences in body form, sculpturing, and color.

MEASUREMENTS (mm) Holotype major: HW 0.94, HL 1.02, SL 0.46, EL 0.10, PW 0.54.

Paratype minor: HW 0.50, HL 0.56, SL 0.42, EL 0.06, PW 0.34.

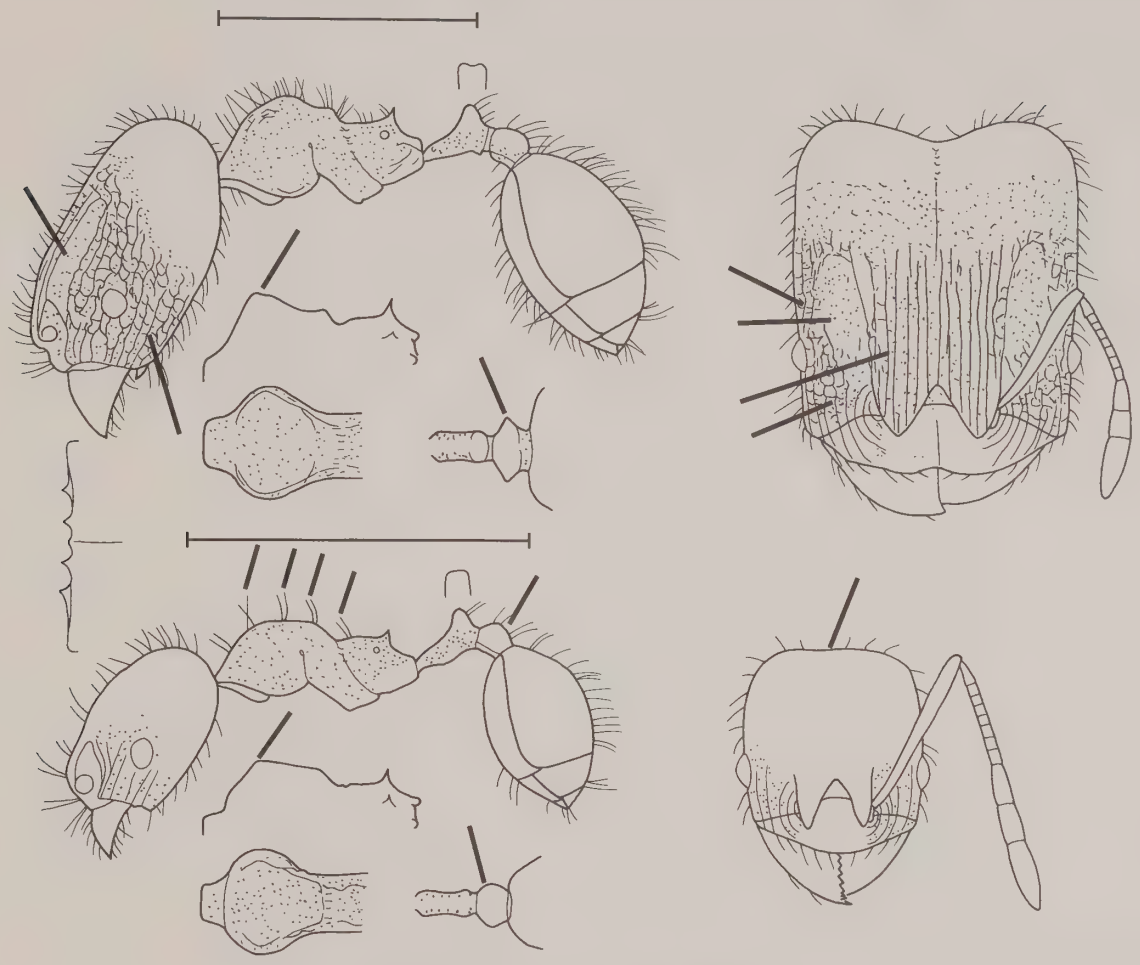
COLOR Major: gaster light yellowish brown, rest of body and appendages dark yellow.

Minor: concolorous light yellowish brown.

RANGE Atlantic slope of Cordillera Central, Costa Rica (Longino 1997).

BIOLOGY The type series, representing either one or several colonies, was found in mature wet forest under epiphyte mats in a canopy tree (Longino 1997).

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: 10 km east of Campeche, Yucatán Peninsula (E. O. Wilson). Scale bars = 1 mm.

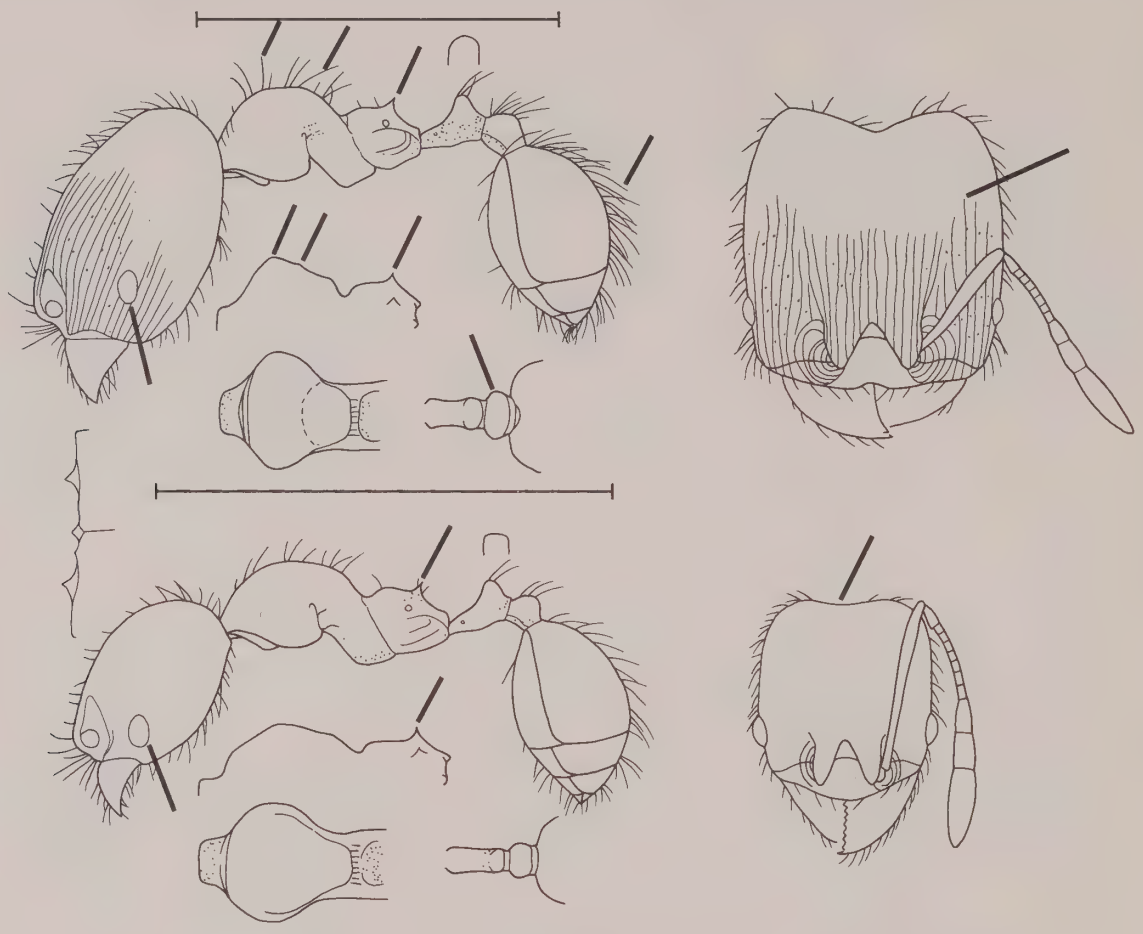


Pheidole dumicola **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *dumicola,* dweller in thorn-bush.
DIAGNOSIS Similar to *charazana* and *floricola,* differs as follows.
Major: head subrectangular and moderately elongate, with straight sides; antennal scrobes present; most of anterior half of head rugoreticulate, including outer margins of frontal lobes and all of genae but not antennal fossae, frontal triangle or midclypeus; humerus in dorsal-oblique view raised and lobose; all of mesosoma foveolate; postpetiole from above spinose.
Minor: pilosity sparse, with hairs on mesosomal dorsum consisting of well-spaced pairs of equal length; humerus in dorsal-oblique view subangulate; occiput broad, its margin straight; postpetiole from above large, circular, nearly 2× broader than petiole.
MEASUREMENTS (mm) Holotype major: HW 0.82, HL 1.00, SL 0.44, EL 0.12, PW 0.46.
Paratype minor: HW 0.38, HL 0.46, SL 0.40, EL 0.06, PW 0.26.
COLOR Major and minor: light yellowish brown.
RANGE Known only from the type locality.
BIOLOGY The type series, including winged reproductives, was collected from a soil nest in second-growth thorn forest, on 28–29 August 1953.

Compare with species listed
in the Diagnosis below

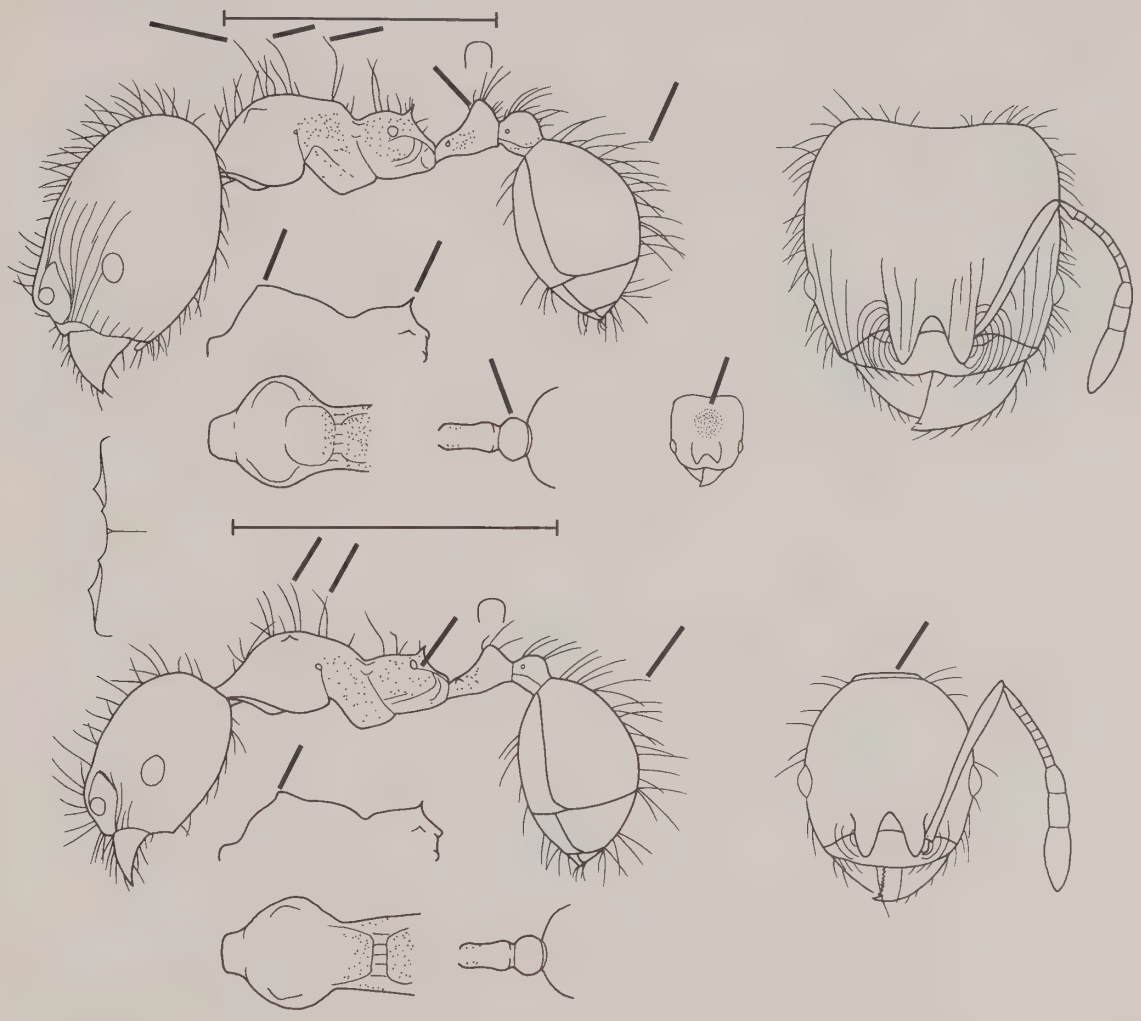
FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Petilla Research Station, Guanacaste Conservation Area, Guanacaste Province, 500 m (David Olson). Scale bars = 1 mm.



Pheidole ebenina **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *ebenina,* black.
DIAGNOSIS Close to and possibly synonymous with *laselva,* also similar in various traits to *albipes, alticola, browni, crinita, delicata, euryscopa, lustrata, mallota, melastomae, monteverdensis,* and *tillandsiarum,* differing by the following traits.
Major: dark, almost blackish brown; eyes set well forward on head; pilosity dense and long, with some hairs equal to Eye Length; promesonotal profile in side view semicircular, in dorsal-oblique view with two low pronotal convexities and a somewhat larger mesonotal convexity; propodeal spines equilaterally triangular; postpetiolar node from above elliptical; posterior half of head and all of mesosoma smooth and shiny.
Minor: eyes set very far forward in head; entire body almost completely smooth and shiny; propodeal spines equilaterally triangular.
MEASUREMENTS (mm) Holotype major: HW 0.68, HL 0.76, SL 0.38, EL 0.08, PW 0.34.
Paratype minor: HW 0.38, HL 0.42, SL 0.36, EL 0.08, PW 0.24.
COLOR Major: body dark, almost blackish brown; appendages dark yellow.
Minor: body dark brown, appendages dark yellow.
RANGE Known from the type locality and a series from Buenaventura, Valle, Colombia (W. L. Brown).
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. ECUADOR: Endesa Forest Reserve, Pichincha Province (Leeanne Tennant-Alonso). Scale bars = 1 mm.



Pheidole ecuadorana **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the country of the type locality.

DIAGNOSIS A medium-sized bicolorous (**major**) or light brown (**minor**) species with extremely long pilosity in both castes; narrow occiput with following collar in the **minor**; high, subangular humerus in dorsal-oblique view in the **major**; and mostly smooth shiny head and pronotum in both castes. The propodeal spiracle of the minor is unusual in its elliptical shape and position on the propodeum.

Most similar to *erratilis, flavifrons,* and *petersoni,* but differing in many details of body shape, sculpturing, pilosity, as illustrated, and in color.

MEASUREMENTS (mm) Holotype major: HW 0.82, HL 0.82, SL 0.50, EL 0.10, PW 0.42.
Paratype minor: HW 0.50, HL 0.54, SL 0.50, EL 0.06, PW 0.32.

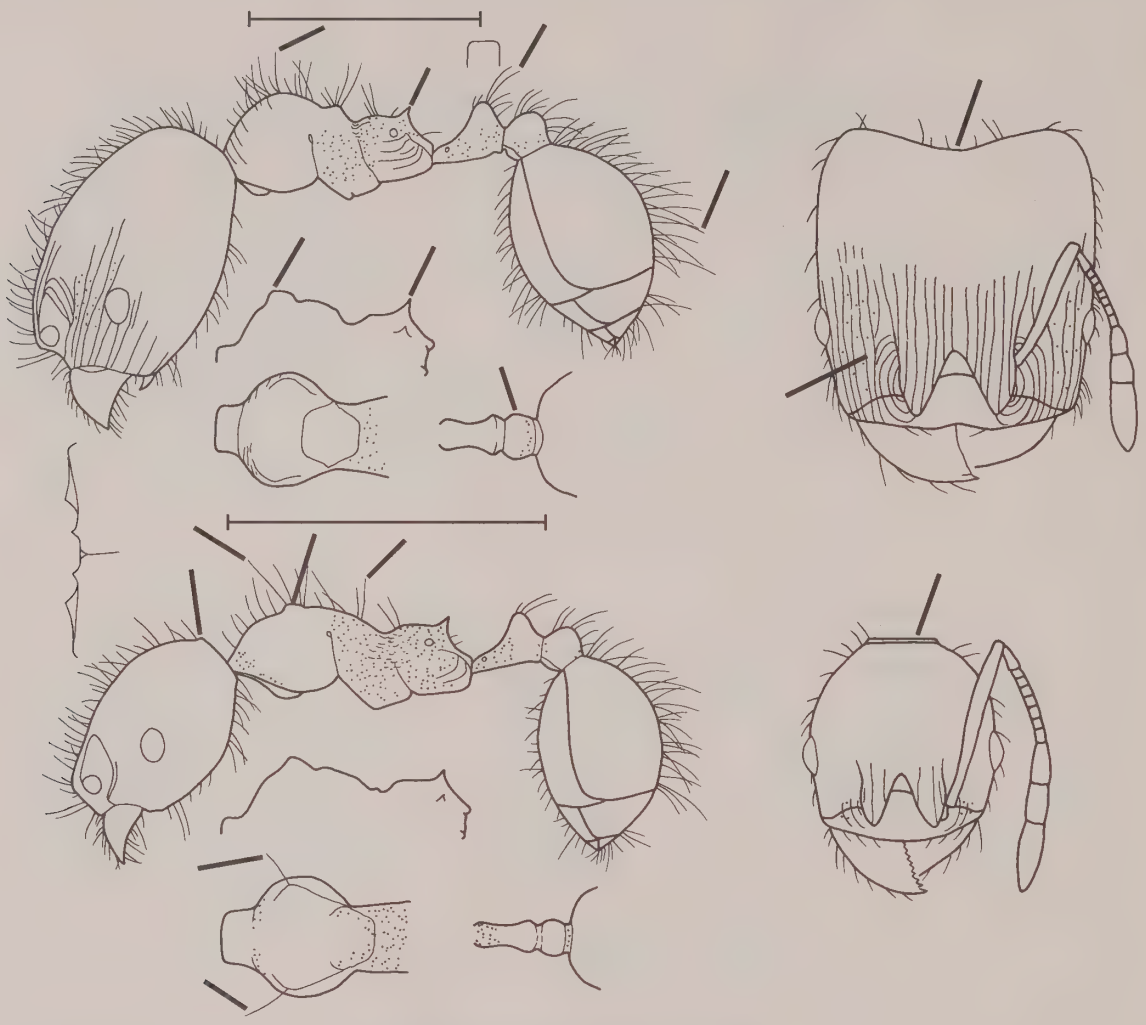
COLOR Major: head yellow with large, circular, medium-brown spot on vertex as shown; appendages yellow; rest of body brownish yellow.
Minor: concolorous light brown.

RANGE Known only from the type series.

BIOLOGY Collected in a clearing created by a tree fall in second-growth forest.

Compare with *petersoni*

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: 3 km south of Arenal Volcano, 700 m (J. T. Longino). Scale bars = 1 mm.



Pheidole erratilis **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *erratilis,* wanderer, alluding to the wide range of habitats occupied in Costa Rica.

DIAGNOSIS A relatively large, brown member of the *flavens* group distinguished by a combination of exceptionally long pilosity and prominent, "sharkfin" shape of the humerus in **major** and **minor**, and narrow occiput surmounted by a collar in the **minor**.

Similar to *petersoni* of Costa Rica but with longer pilosity and absence of rugoreticulum on the mesosoma in both castes, and more extensive cephalic carinulae in the **major** (but less extensive in the **minor**).

See also these less similar species: *angulifera, ecuadorana, pariana, polita* (in the *tristis* group), *tennantae, schmalzi,* and *styrax*.

MEASUREMENTS (mm) Holotype major: HW 1.06, HL 1.12, SL 0.62, EL 0.12, PW 0.48.

Paratype minor: HW 0.56, HL 0.62, SL 0.60, EL 0.14, PW 0.34.

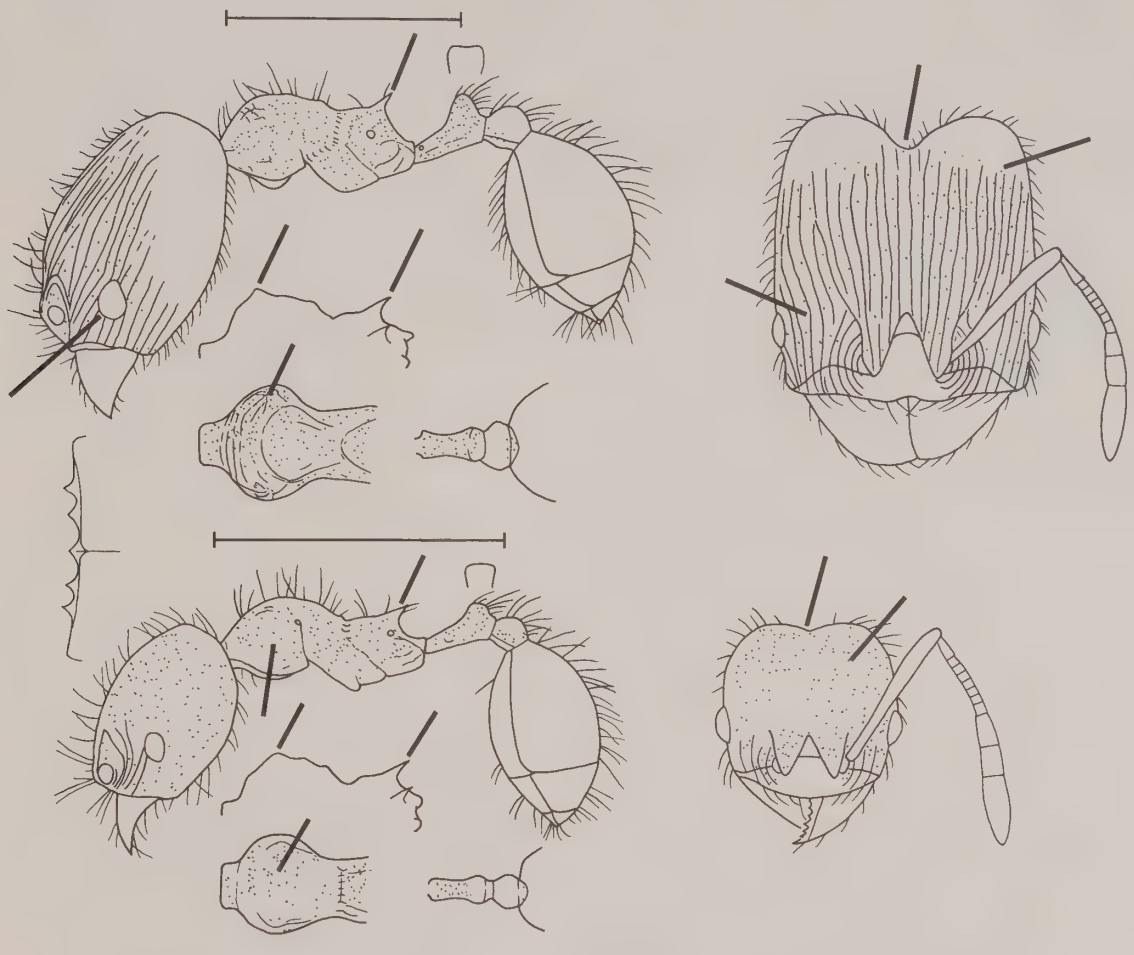
COLOR Major: gaster medium brown, tarsi dark yellow, rest of body and appendages light reddish brown.

Minor: body dark, almost blackish brown, appendages light reddish brown.

RANGE Widespread in wet forest to 800 m in Peñas Blancas and 2000 m in Braulio Carrillo (J. T. Longino 1997).

BIOLOGY Longino (1997): nests in dead wood and dead stems in leaf litter on the forest floor. In the Osa region, a colony was found in necrotic cavities beneath the bracts of a live *Costus* inflorescence.

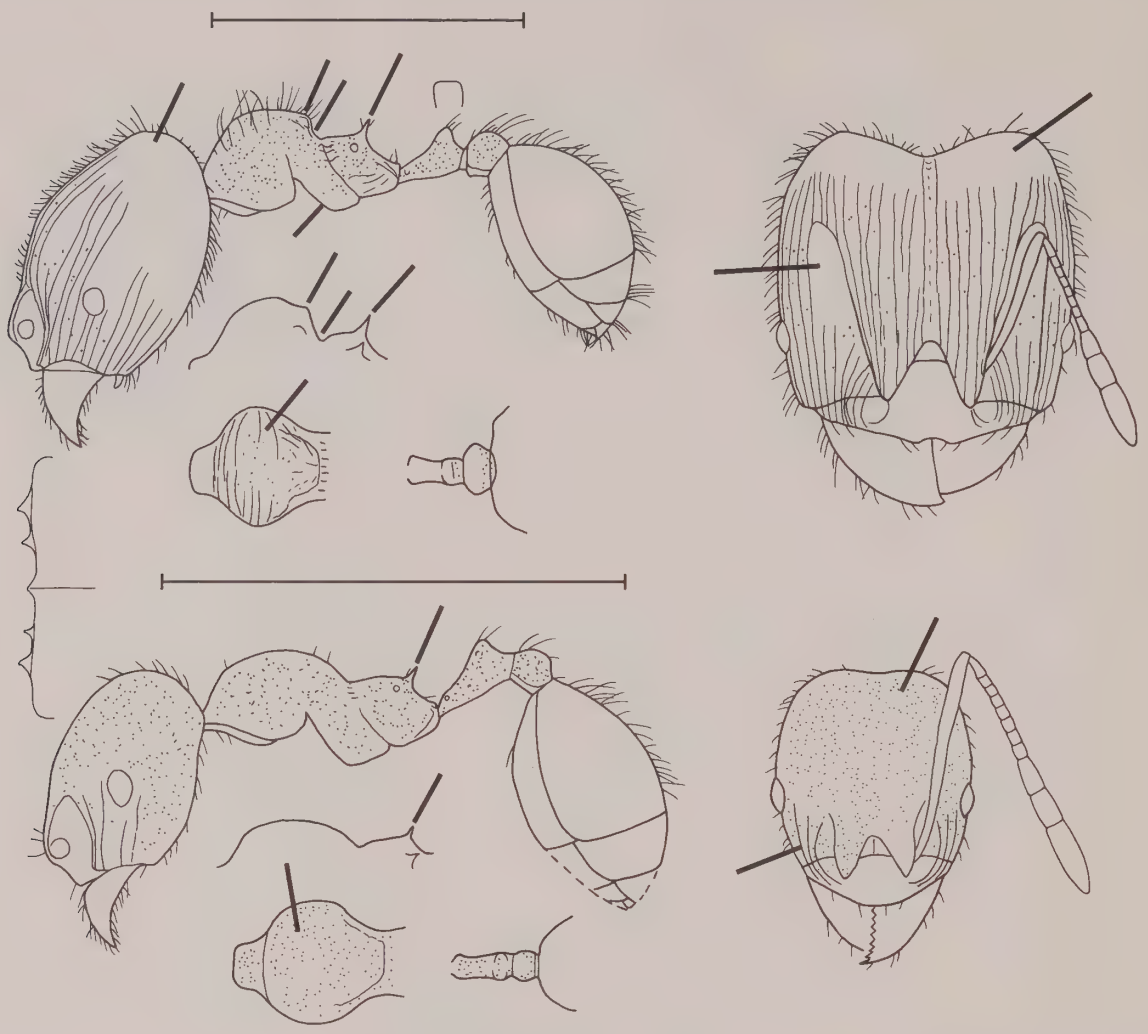
FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Parque Nacional Cuevas de los Guacheros, 10 km southeast of Palestina, Huila, 1900–2000 m (C. Kugler and J. Hahn). Scale bars = 1 mm.



Pheidole euryscopa **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *euryscopa,* wide view, referring to the large, forward-placed eyes.
DIAGNOSIS Similar in various traits to *albipes, alticola, camilla, ebenina, hazenae, lustrata, monteverdensis, palenquensis,* and *servilia,* differing as follows.
Major: reddish yellow; eyes set well forward on head; long, curved, backward-directed propodeal spines; weakly cornulate pronotal humeri; weak mesonotal convexity; and mostly carinulate cephalic dorsum with smooth occiput.
Minor: long, backward-directed propodeal spines.
MEASUREMENTS (mm) Holotype major: HW 0.92, HL 1.02, SL 0.56, EL 0.16, PW 0.46.
Paratype minor: HW 0.54, HL 0.60, SL 0.52, EL 0.10, PW 0.34.
COLOR Major: head and gaster medium reddish yellow with local patches of brownish tinge. Rest of body, and appendages, light to medium reddish yellow.
Minor: medium reddish yellow, appendages plain medium yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. FRENCH GUIANA: Cayenne (collected by "M. Jelski," no first name given). Scale bars = 1 mm.



Pheidole exigua Mayr

Pheidole exigua Mayr 1884: 36. *Pheidole flavens* subsp. *exigua* Emery 1894d: 156.

TYPES Naturhist. Mus. Wien.
ETYMOLOGY L *exigua,* small, trifling.
DIAGNOSIS A member of the "*flavens* complex" within the larger *flavens* group, which includes *asperithorax, breviscapa, exigua, flavens, orbica,* and *sculptior,* and possibly just an extreme variant of *flavens*.
P. exigua is distinguished as follows.
Major: in side and dorsal-oblique views promesonotal profile strongly convex as well as high relative to the metanotum and propodeum, and dropping to the metanotum through a long, almost vertical face; shallow antennal scrobes present, their surfaces smooth and shiny, their anterior third also covered by longitudinal carinulae; intercarinular spaces of head sparsely foveolate to feebly shiny; occiput smooth and shiny; pronotal dorsum mostly covered by transverse carinulae, its surface sparsely foveolate and feebly shiny; posterior half of dorsal head profile flat.
Minor: carinulae confined to head anterior the eyes; almost all of head, mesosoma, and sides of waist foveolate and opaque.
MEASUREMENTS (mm) Lectotype major: HW 0.80, HL 0.84, SL 0.44, EL 0.08, PW 0.36.
Paralectotype minor: HW 0.40, HL 0.46, SL 0.38, EL 0.06, PW 0.24.

COLOR Major: body except gaster medium reddish yellow; gaster medium plain yellow, except for rear half of first tergite, which is light brown.

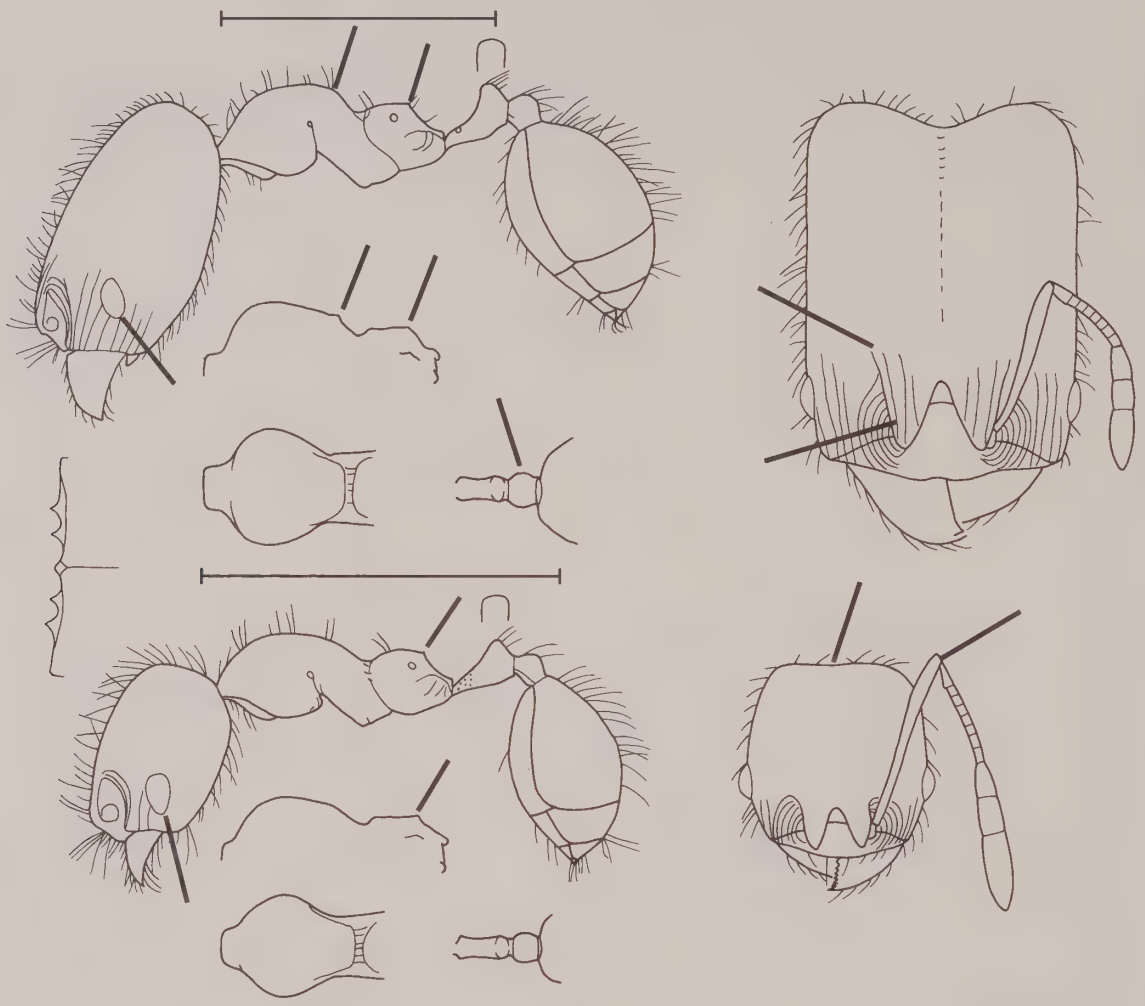
Minor: body and mandibles brownish yellow; other appendages medium plain yellow.

RANGE I have seen material from Costa Rica, Cuba, Puerto Rico, Trinidad, Guyana, French Guiana, and Las Gamas, Santa Cruz, Bolivia, while Kempf (1972b) records it in addition from Pará and Pernambuco in Brazil.

BIOLOGY At La Sagasse Bay on Grenada, West Indies, Stefan Cover and I found several colonies of *exigua* in small pieces of rotten wood on the floor of dry semi-deciduous forest. A colony of the closely similar *P. flavens* was in a rotten stump on the grounds of an ecotourism resort several hundred meters away.

Compare especially with *nitella,* also with
christopherseni, nigricula, olsoni, protensa, pygmaea, sagittaria

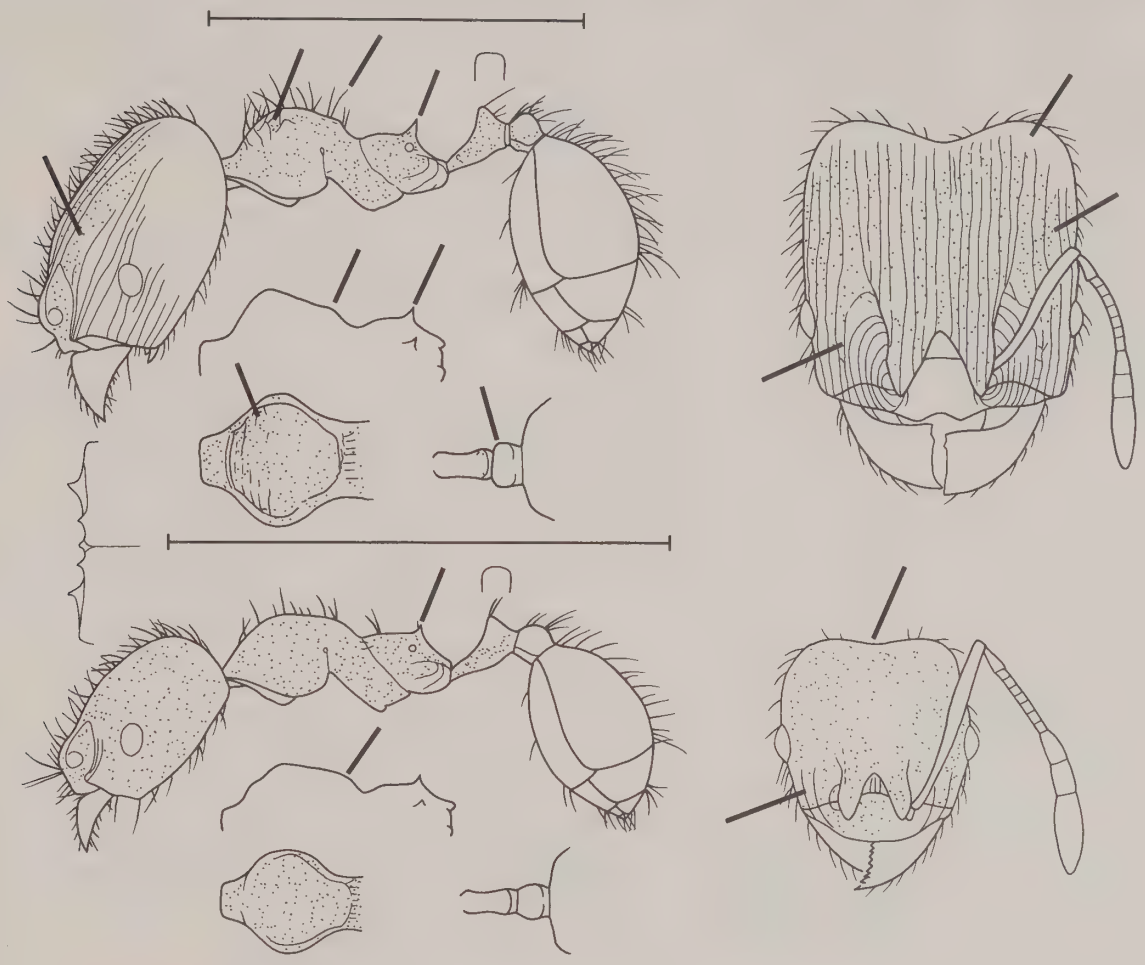
FIGURE Upper: holotype, major. Lower: paratype, minor. ECUADOR: 3 km east of Tandapi, Pichincha, 1300 m (Stewart B. and Jarmila Kukalová-Peck). Scale bars = 1 mm.



Pheidole exquisita **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *exquisita,* excellent, choice, fine.
DIAGNOSIS Similar in various traits to the species listed in the heading above, differing as follows.
Major: yellow; head elongate as shown; eyes set far forward, so that their distance from anterior margin of head is only an Eye Length; propodeal spines absent, replaced by obtuse angle (side view) or rounded juncture (dorsal-oblique view); carinulae extend only slightly behind eye level of head, including frontal lobes, and rest of body entirely smooth and shiny.
Minor: eye large, tapered anteriorly, and set far forward on head; propodeal spines reduced to denticles; carinulae on head extend only back to anterior margin of eyes, and all the rest of head and body smooth and shiny; occiput broad, its margin flat.
Differs from the closely similar *nigella* in size, head shape, cephalic sculpture, eye shape, and minor scape length.
MEASUREMENTS (mm) Holotype major: HW 0.76, HL 1.08, SL 0.46, EL 0.12, PW 0.44.
Paratype minor: HW 0.44, HL 0.52, SL 0.48, EL 0.10, PW 0.28.
COLOR Major and minor: concolorous medium yellow.
RANGE Known from the type locality (3 km east of Tandapi, Ecuador, at 1300 m), and nearby, 15 km east of Tandapi at 2300 m.
BIOLOGY The holotype colony was collected in litter of rainforest in a ravine.

FIGURE Upper: neotype, major. Lower: paraneotype, minor. CUBA: Barrajagua, Las Villas (E. O. Wilson). Scale bars = 1 mm.



Pheidole flavens Roger

Pheidole flavens Roger 1863a: 166. Syn.: *Pheidole exigua* var. *tuberculata* Mayr 1887: 585, changed to *flavens* subsp. *tuberculata* Emery 1894d: 157, n. syn.; *Pheidole flavens* var. *vincentensis* Forel 1893j: 411, n. syn.; *Pheidole flavens* r. *gracilior* Forel 1901m: 78, n. syn.; *Pheidole flavens* r. *navigans* Forel 1901m: 79, n. syn.; *Pheidole flavens* var. *haytiana* Forel 1907h: 6, n. syn.; *Pheidole flavens* st. *spei* Santschi 1930e: 77, n. syn.; *Pheidole floridana* subsp. *aechmeae* Wheeler 1934g: 166, n. syn.; *Pheidole greggi* Naves 1985: 62, n. syn.

Types or other authenticated material not seen: *Pheidole flavens* var. *thomensis* Emery 1894d: 156 (St. Thomas, West Indies); *Pheidole flavens* var. *farquharensis* Forel 1907g: 91 (Madagascar).

Unavailable names (ineligible quadrinomials) include *Pheidole flavens tuberculata* var. *jheringi* Emery 1894d: 157 (Rio Grande do Sul, Brazil); *Pheidole flavens asperithorax* var. *semipolita* Emery 1896g: 78 (Pará, Brazil); *Pheidole flavens sculptior* var. *grenadensis* Forel 1897b: 300 (Grenada, West Indies); *Pheidole flavens asperithorax* var. *nugax* Forel 1908h: 380 (Brazil); *Pheidole flavens tuberculata* var. *putata* Forel 1912g: 235 (São Paulo, Brazil); *Pheidole flavens tuberculata* var. *platensis* Forel 1914d: 273 (Buenos Aires, Argentina).

Raised to species level in this monograph: infraspecific forms *asperithorax, breviscapa, exigua, rudigenis, sculptior*.

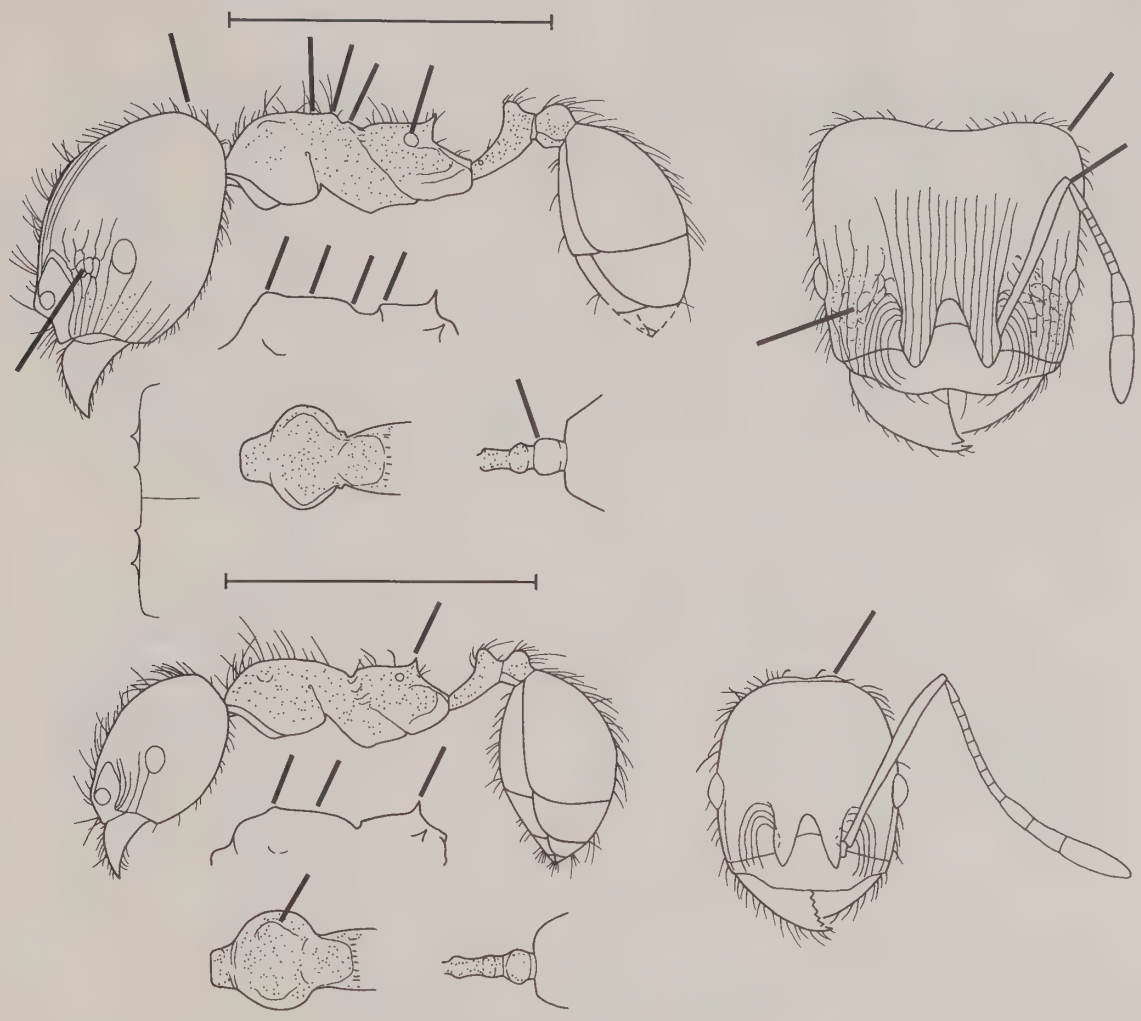
TYPES Mus. Comp. Zool. Harvard. (The neotype was selected for this monograph after searches in collections containing Roger material failed to turn up the original types. The neotype, from the same country as the Roger type, fits the general concept of *flavens* held by systematists.)

ETYMOLOGY L *flavens,* yellow.

DIAGNOSIS An extremely abundant, widespread species belonging to a complex of small, yellow, closely similar species that also includes *asperithorax, breviscapa, cardiella, chloe, exigua, goeldii, kuna, mittermeieri, moerens, nitidicollis, nuculiceps, pholeops, striaticeps,* and *trinitatis*. *P. flavens* differs from them in the following combination of traits.

Major: a shallow, relatively indistinct antennal scrobe present, its surface foveolate and opaque; weak rugoreticula often present mesad to the eyes and at the posterior end of the carinulae on the lateral dorsal surface of the head, which are variable in extent and sometimes absent; carinulae along the midline of the dorsum of the head reaching the occipital border but occipital lobes seen in full-face view smooth and shiny; humeri usually with a small patch of rugoreticulum; lateral margins of pronotal dorsum also lined with short transverse carinulae; propodeal spine well-developed; postpetiolar node from above roughly trapezoidal; most of dorsal surface of head, all of mesosoma, and sides of waist foveolate and opaque.
Minor: carinulae limited to space mesad to antennal fossa and occasionally also to the frontal lobes and frontal triangle; all of head and mesosoma and sides of waist foveolate and opaque; dorsum of waist and all of gaster smooth and shiny; occiput broad and shallowly concave.
P. flavens is easily confused with *P. exiqua* and *P. moerens,* also widespread and abundant species; see the differences under Diagnosis of those species in particular.
MEASUREMENTS (mm) Neotype major: HW 0.72, HL 0.74, SL 0.42, EL 0.08, PW 0.32.
Paraneotype minor: HW 0.34, HL 0.42, SL 0.34, EL 0.06, PW 0.24.
COLOR Major and minor: medium to dark yellow.
RANGE *Pheidole flavens* rivals *P. jelskii* as the most widespread and abundant species of the genus in the New World. Or, put more cautiously, this species or (possibly) this tightly knit group of sibling species I have considered to be the single species *flavens* has this distinction. It ranges from Florida, where it likely was introduced accidentally by commerce, thence throughout the West Indies, Central America, and most of tropical and subtropical South America as far south as Santa Catarina in Brazil. *P. flavens* colonies are easily transported by human agency, especially as hitchhikers in nursery stock, as witness the synonymous "var. *gracilior*" and "var. *navigans,*" described by Auguste Forel from intercepted live ants in the German quarantine. I collected specimens from a thriving colony in a potted plant from Florida that had been transported to the office of the president of the World Wildlife Fund-U.S. in Washington, D.C. (at first I considered it a new sibling species but have since decided to place it within the broad variation of *flavens*). Even Forel's "variety *farquharensis*" from Madagascar, whose types I have not been able to locate, is almost certainly, if it is truly *flavens,* to have the same provenance.
BIOLOGY The wide range and abundance of *Pheidole flavens* is due at least in part to its ability to use different microhabitats as nesting sites. Judging from the extensive data of H. H. Smith (in Forel 1893j) on St. Vincent and J. T. Longino (1997) in Costa Rica, as well as my own collecting records, *flavens* prefers rotting pieces of wood, but also utilizes spaces beneath the bark of trees, dead knots on tree trunks, sod on rocks, the soil beneath stones, and epiphyte masses. On St. Vincent it occurred (in the early 1890s at least) in forests and thickets from sea level to 900 m, and in Costa Rica it is found today in both wet and dry forests. The nest galleries are diffuse and irregular, the queens hard to find, and mature colonies large, containing up to thousands of workers. Workers collect small arthropods: a captive colony from Trinidad I maintained for over a year eagerly harvested live oribatid mites, and the workers had no difficulty abrading through their hard, smooth exoskeletons. Workers also recruit to sugar baits.

FIGURE Upper: lectotype, major. Lower: minor, presumably from lectotype nest series. BRAZIL: Santa Catarina. Scale bars = 1 mm.



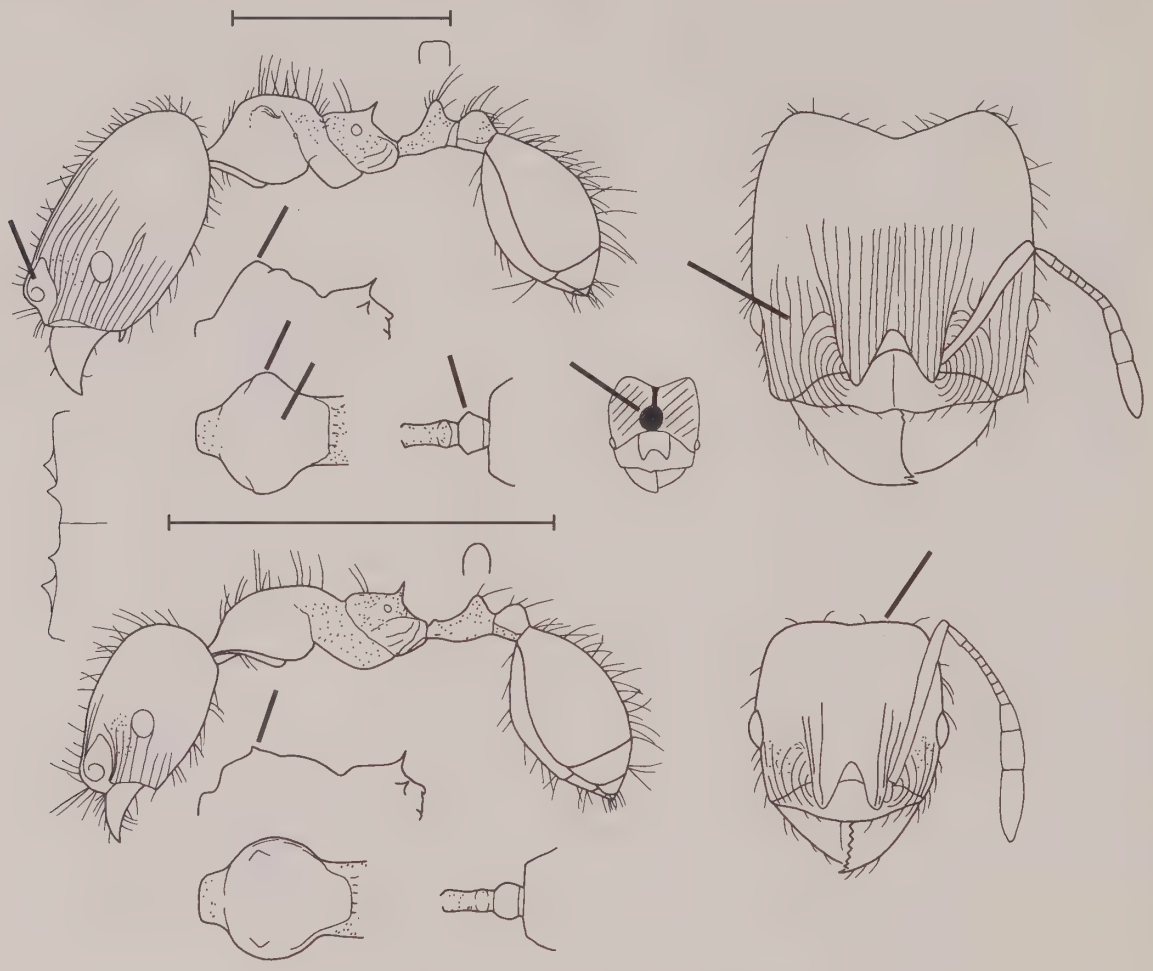
Pheidole flavida Mayr

Pheidole flavida Mayr 1887: 593.

TYPES Naturhist. Mus. Wien.
ETYMOLOGY L *flavida,* yellowish.
DIAGNOSIS A very distinctive member of the *flavens* group, distinguished as follows.
Major: yellow; seen in side view, head tapered such that occiput in this view is much narrower than anterior margin of head; in full-face view the occiput is expanded to be much larger than the anterior head margin; promesonotum low and flat, in side view dropping abruptly through a short, steep face to the metanotum, which is wide and weakly convex; antennal scapes relatively long, their tips reaching the margin of the head in full-face view well behind the midpoint between the eyes and occipital lobes; humerus in dorsal-oblique view low and subangulate; rugoreticulum present between eye and antennal fossa on both sides.
Minor: promesonotum low and weakly convex; humerus obtusely subangulate; head with mandibles in full-face view symmetrically oval; occiput narrowed, with a thin nuchal collar.
MEASUREMENTS (mm) Lectotype major: HW 0.80, HL 0.76, SL 0.54, EL 0.12, PW 0.42.
Minor: HW 0.52, HL 0.58, SL 0.58, EL 0.12, PW 0.34.
COLOR Major and minor: concolorous medium yellow.
RANGE Known only from the type series.
BIOLOGY Unknown.

Compare with *arhuaca* and *amazonica*
and other species listed in the Diagnosis below

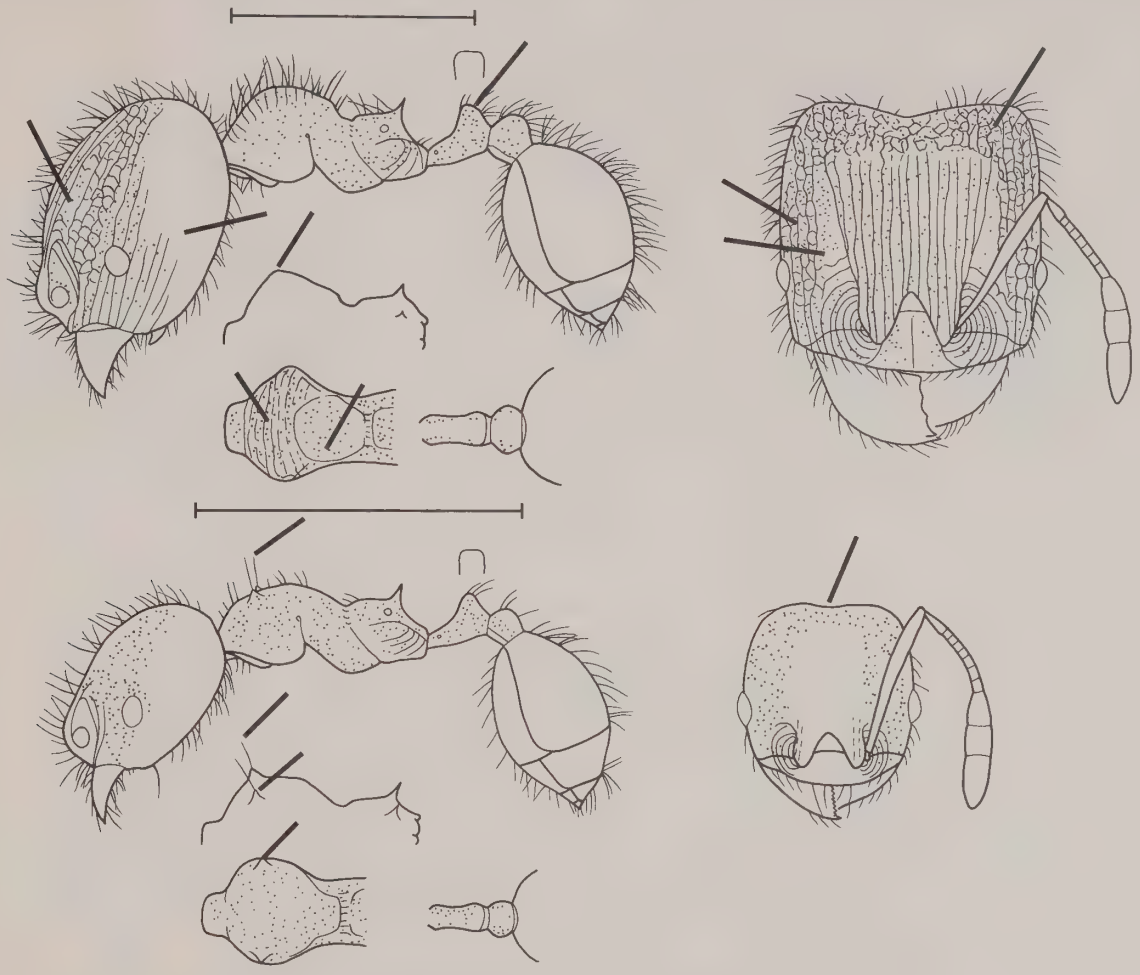
FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios (Stefan Cover and John E. Tobin). Scale bars = 1 mm.



Pheidole flavifrons **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *flavifrons,* yellow front, pertaining to the anterior half of the major's head.
DIAGNOSIS A medium-sized, uniquely multicolored member of the *flavens* group, whose **major** has a prominent, subangular humerus and exclusively carinulate head, and the **minor** has a dentate humerus.
Most similar to *arhuaca* of Colombia but with different color, and in the **major** a smooth (not foveolate) pronotal dorsum; and to *amazonica,* differing in head sculpture and shape of humerus.
See also the less similar *minutula, nitidicollis,* and *teneriscens,* and other species listed as close to *arhuaca* (q.v.).
MEASUREMENTS (mm) Holotype major: HW 0.86, HL 0.92, SL 0.44, EL 0.10, PW 0.44.
Paratype minor: HW 0.44, HL 0.48, SL 0.40, EL 0.08, PW 0.28.
COLOR Major: anterior half of head yellow, posterior half yellowish brown, with a dark brown circular spot in the center of the head capsule dorsum; body medium brown, mandibles and scape light brown, rest of appendages yellow.
Minor: body dark brown; appendages, clypeus, and anterior genal margins yellow.
RANGE Known only from the type locality in Amazonian Peru.
BIOLOGY The type series was taken from beneath the bark of a tree in a terra firme tree fall.

FIGURE Upper: holotype, major. Lower: paratype, minor. HONDURAS: La Ceiba, Depto. Atlántida (collector unknown, probably W. L. Brown). Scale bars = 1 mm.

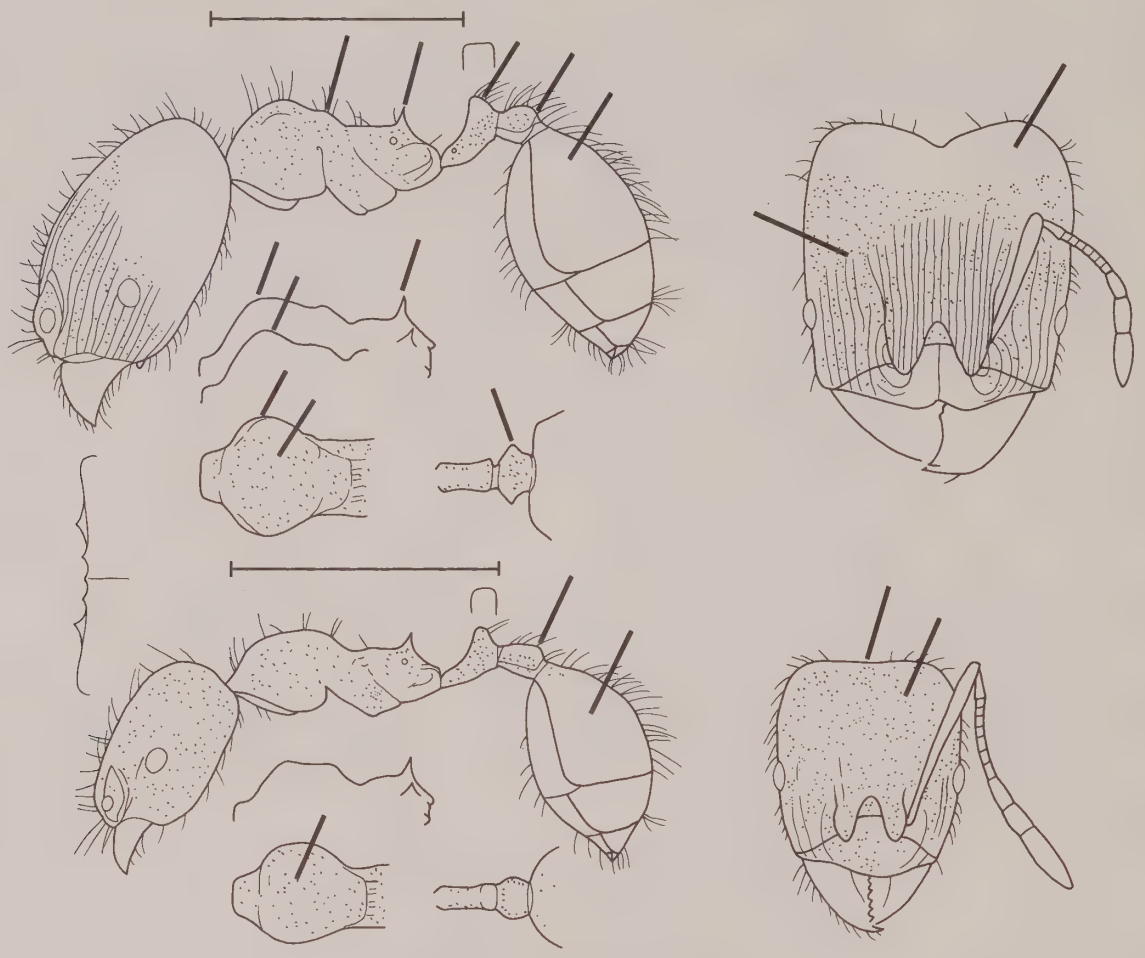


Pheidole floricola **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Old French, L *floricola,* flower inhabitant.
DIAGNOSIS Similar in various traits to species listed in heading above, distinguished as follows.
Major: yellow; antennal scrobes present; rugoreticulum continuous all the way from the spaces between the eyes and antennal fossae posteriorly to and including the occiput; posterior half of sides and all of venter of head smooth; humerus in dorsal-oblique view subangulate; apex of petiolar node in side view very broad and rounded; all of pronotal dorsum carinulate, and rest of mesosoma solely foveolate; antennal funiculi with abundant, very long, erect hairs; femora swollen.
Minor: humeri with paired equilateral teeth, each of which bears a single long hair; posterior and lateral margins of head and all of mesosoma foveolate.
MEASUREMENTS (mm) Holotype major: HW 0.80, HL 0.82, SL 0.46, EL 0.10, PW 0.44.
Paratype minor: HW 0.46, HL 0.50, SL 0.42, EL 0.08, PW 0.30.
COLOR Major and minor: concolorous medium yellow.
RANGE Known only from the type locality.
BIOLOGY Collected "inside philodendron fruit."

Compare with *bilimeki, daphne, morelosana, stomachosa*

FIGURE Upper: lectotype, major (damaged specimen; pilosity added from a fresh specimen); the upper dorsal-oblique profile of mesosoma is the lectotype, and the lower profile is a major from Sarasota, Florida. Lower: paralectotype, minor (damaged specimen; pilosity added from a fresh specimen). Scale bars = 1 mm.

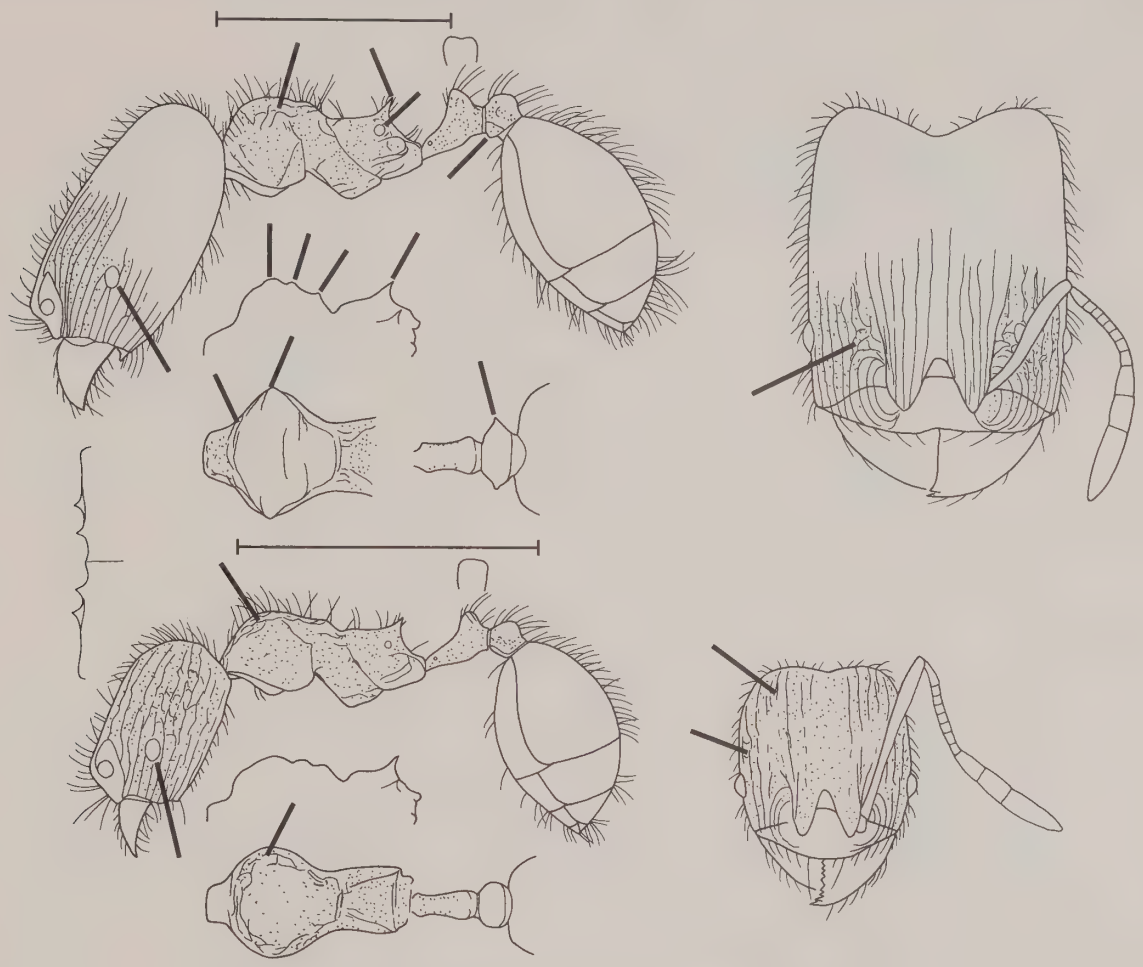


Pheidole floridana Emery

Pheidole flavens subsp. *floridana* Emery 1895d: 293. Raised to species level by Pergande 1896: 883. Syn.: *Pheidole lauta* Wheeler 1908h: 470, synonymy by Gregg 1959: 21.

TYPES Mus. Comp. Zool. Harvard; Mus. Civ. Stor. Nat. Genova.
ETYMOLOGY Named after the state of origin.
DIAGNOSIS Nearly identical with *bilimeki* and its Neotropical variants, distinguished as follows.
Major: foveolation on dorsum of head very fine; first gastral tergite smooth and shiny; humerus less prominent in dorsal-oblique view.
Minor: antennal scapes relatively short, just reaching or barely surpassing the occipital corner; first gastral tergite smooth and shiny, with at most a light shagreening at the base of the tergite.
Both castes are consistently yellow. *P. floridana* is very close to *bilimeki,* and also to *stomachosa* of Jamaica, which coexists on the island with *bilimeki*. *P. stomachosa* is distinguished from both *bilimeki* and *floridana* by the head and pronotum of the **minor** being smooth and shiny (q.v.).
MEASUREMENTS (mm) Lectotype major: HW 0.92, HL 1.00, SL 0.44, EL 0.10, PW 0.46.
Paralectotype minor: HW 0.44, HL 0.52, SL 0.42, EL 0.06, PW 0.30.
COLOR Major and minor: concolorous yellow.
RANGE *P. floridana* has been recorded by Stefan Cover (personal communication) from the coastal plain of North Carolina south to the Florida Keys and west to central Texas (Austin and surrounding area), thence south into Mexico.
BIOLOGY At Bald Point, Franklin Co., Florida, I found colonies nesting at a roadside in open sandy soil; and in Mobile, Alabama (in 1942) what was probably this species nesting beneath a whiskey bottle in a vacant lot. Winged reproductives have been found in nests during September and October. Stefan Cover (personal communication) reports that *floridana* "occurs in a variety of woodland habitats, nests in soil, litter, and rotten wood, and in both xeric and mesic situations. Colonies are monogynous, may contain 1000 or more ants, and are sometimes polydomous. The species is omnivorous, but does not appear to harvest seeds."

FIGURE Upper: holotype, major. Lower: paratype, minor. ARIZONA: 6.9 km west-northwest of junction FSR42 and FSR42B, Cochise Co., 1650 m (Stefan Cover). Scale bars = 1 mm.



Pheidole furtiva **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *furtiva,* hidden, concealed, alluding to the nest site.

DIAGNOSIS Similar in various traits to *chalca, floridana, daphne, nebulosa, quercicola, specularis, stomachosa,* and *tysoni,* but easily distinguished as follows.

Major: dark yellow; head elongate, subrectangular; eyes very small; from above, humeri angulate and overhanging rest of pronotum, and in dorsal-oblique view are bilobate; mesonotal convexity in dorsal-oblique view angulate; propodeal spiracles large; propodeal spines robust, directed backward; angular subpostpetiolar process present in side view; postpetiole from above broad and spinose; small patch of rugoreticulum present behind each antennal fossa.

Minor: head mostly carinulate and foveolate, with a rugoreticulum behind each eye; anterior and lateral margins of pronotal dorsum rugulose and rugoreticulate, and all of mesosoma foveolate.

MEASUREMENTS (mm) Holotype major: HW 0.90, HL 1.08, SL 0.56, EL 0.06, PW 0.46.
Paratype minor: HW 0.54, HL 0.60, SL 0.52, EL 0.04, PW 0.32.

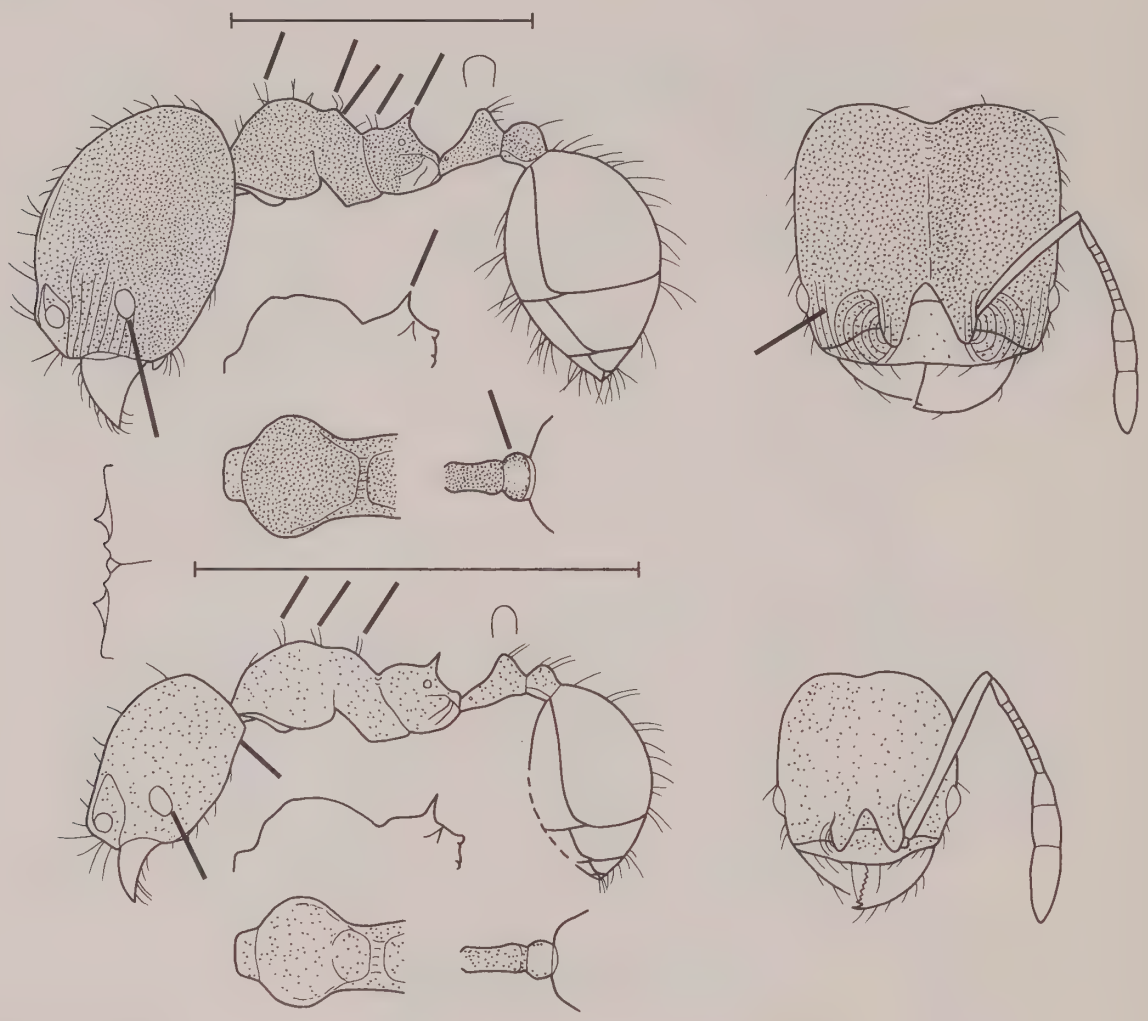
COLOR Major: body dark yellow, appendages medium yellow.
Minor: concolorous medium yellow.

RANGE Known only from several Arizona collections made by Stefan Cover in the Chiricahua Mts., 1550–1650 m; Pajarito Mts., Santa Cruz Co., 1110 m; and Patagonia Mts., 1420 m.

BIOLOGY The type colony was found nesting in soil beneath a pat of dried cow dung in a grassy, grazed meadow with scattered juniper (Stefan Cover). Other colonies were found by Cover beneath a rock in a grassy juniper flat, in a cryptic soil nest on a rocky hillside covered by acacia-opuntia scrub, and under a rock in an overgrazed, grassy creek valley.

Compare with *micridris*

FIGURE Upper: holotype, major (20–30 km east-northeast of Alluriquin on Chiriboga Road, Pichincha, Ecuador, 1400–1800 m). Lower: paratype, minor (Tinlandia, 16 km southeast of Santo Domingo de Los Colorados, Pichincha, Ecuador, 520 m). Scale bars = 1 mm.



Pheidole geminata **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *geminata,* pair, twinned, referring to the paired mesosomal setae.

DIAGNOSIS Similar to *micridris* but distinguished from it and other *Pheidole* species as follows.

Major: head in full-face view quadrate, with Head Width equaling Head Length; eyes set well forward on head; pilosity sparse, especially so on mesosomal dorsum, where it comprises widely and evenly spaced pairs of setae; mesonotal convexity low but well developed in side view; propodeal spines as long as half the propodeal basal face and directed backward; postpetiole oval from above; carinulae limited to eye level on head and anterior to it; all of head, mesosoma, and petiole foveolate.

Minor: eye set far forward on head; posterior half of ventral head profile weakly concave; pilosity sparse, and on mesosomal dorsum comprising widely and evenly spaced pairs of setae; all of head, mesosoma, and petiole foveolate.

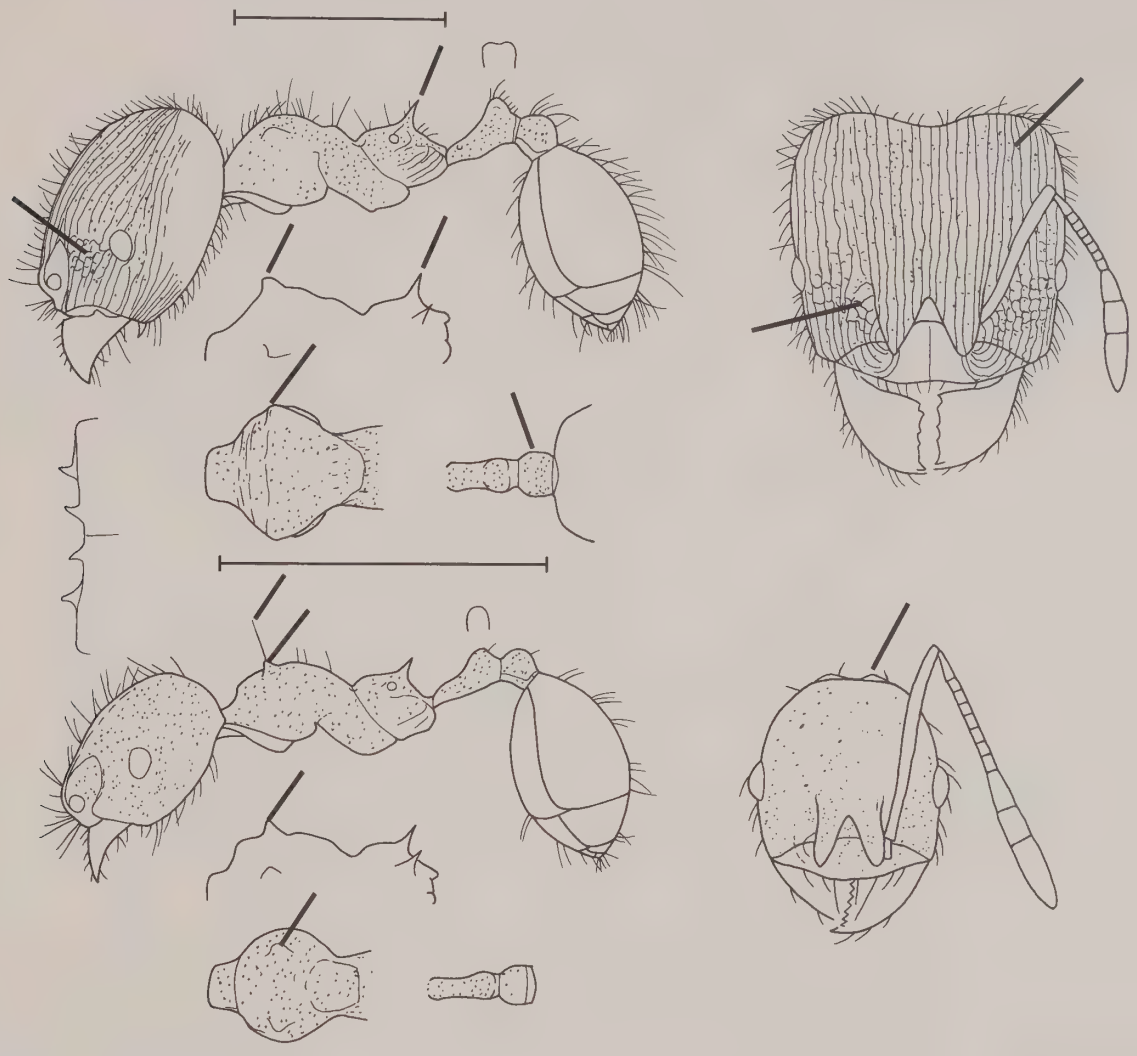
MEASUREMENTS (mm) Holotype major: HW 0.92, HL 0.92, SL 0.58, EL 0.12, PW 0.42.
Paratype minor (Tinlandia, Ecuador): HW 0.40, HL 0.44, SL 0.42, EL 0.06, PW 0.24.

COLOR Major: body dark brown, mandibles medium brown, other appendages brownish yellow.
Minor: body yellowish brown, appendages dark yellow.

RANGE Known from the type locality and two localities near Santo Domingo de los Colorados, Pichincha (S. and J. Peck).

BIOLOGY The type series is from mossy montane forest, and the 520 m Santo Domingo de las Colorados colony from submontane rainforest. A winged queen from the latter locality was collected on 4 June.

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios (Stefan Cover and John E. Tobin). Scale bar = 1 mm.

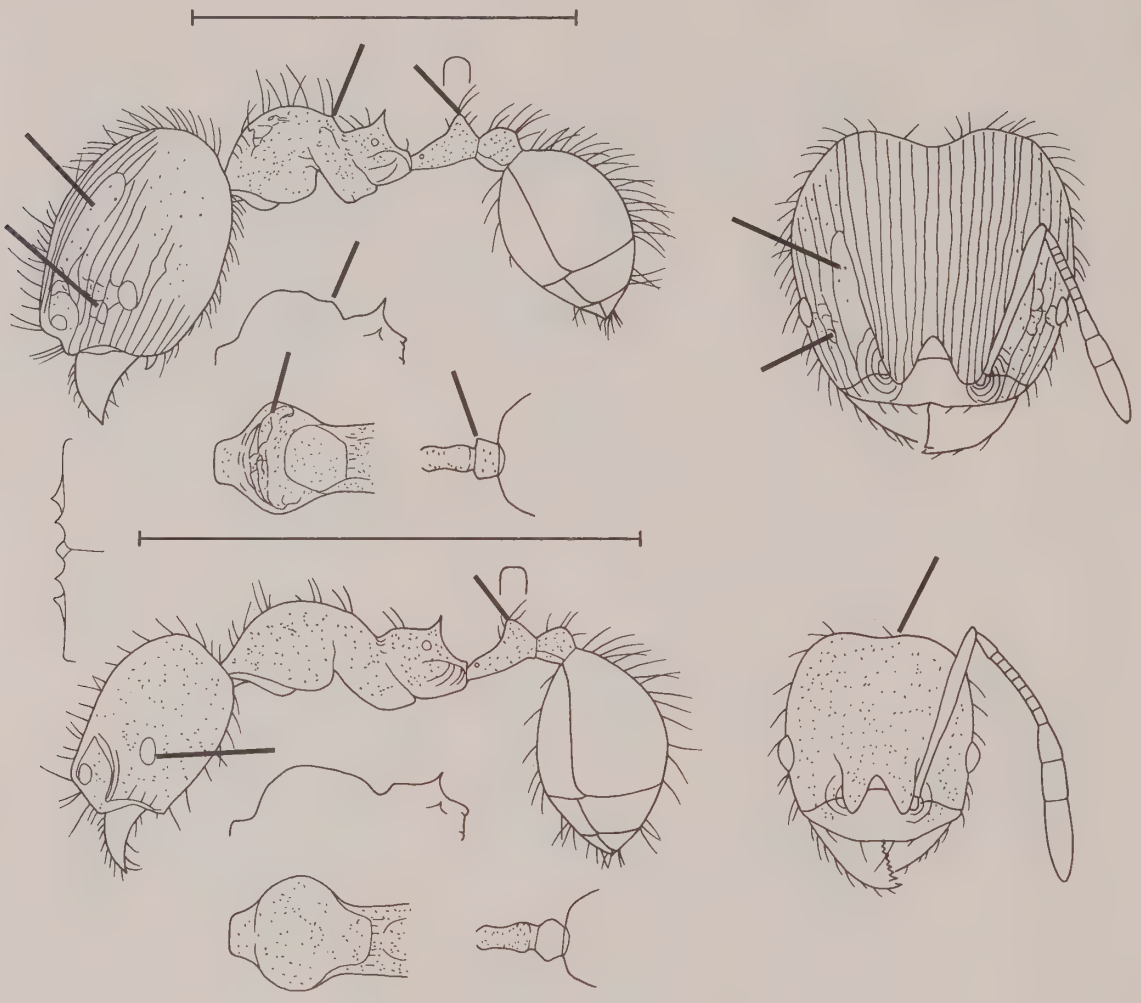


Pheidole gilva **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *gilva,* pale yellow, alluding to color of minor.
DIAGNOSIS Similar in various traits to the species listed in the heading above, differing as follows.
Major: yellow; humeri in dorsal-oblique view are a "sharkfin" shape, pointing forward, and from above extend just beyond the margins of the pronotum below; propodeal spines more than half as long as the propodeal basal face preceding them; postpetiole from above diamond-shaped; rugoreticulum fills space between each eye and adjacent antennal fossa, and rest of dorsal head surface mostly carinulate; most of dorsal head surface and all of mesosoma foveolate.
Minor: humeri acute-angular, each bearing a long seta at the tip; occiput narrowed, with a nuchal collar; all of head, mesosoma, and waist foveolate.
MEASUREMENTS (mm) Holotype major: HW 1.12, HL 1.10, SL 0.64, EL 0.14, PW 0.56.
Paratype minor: HW 0.56, HL 0.62, SL 0.62, EL 0.08, PW 0.38.
COLOR Major: concolorous medium yellow.
Minor: concolorous pale yellow.
RANGE Known only from the type locality.
BIOLOGY The type colony was found in mature terra firme rainforest, nesting in a 8-cm-wide dead branch 3 m from the ground.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: 10 km south of Palenque, Chiapas (William P. MacKay). Scale bars = 1 mm.



Pheidole glomericeps **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *glomericeps,* spherical head.

DIAGNOSIS Similar in various traits to *exigua, moffetti, nana, nuculiceps, orbica, rudigenis, sculptior,* and *styrax,* differing as follows.

Major: outline of head in full-face view circular; antennal scrobes present, anterior fourth of pronotal dorsum, as well as space between eye and antennal fossa, rugoreticulate; promesonotal profile elevated and strongly convex; mesonotal convexity subangulate in side view; petiolar node tapered at apex to a blunt point; postpetiole from above trapezoidal; almost all of mesosoma foveolate.

Minor: eye small and elliptical; promesonotal profile semicircular; occiput broad and weakly concave; petiolar node tapers to point at apex; all of head and mesosoma foveolate.

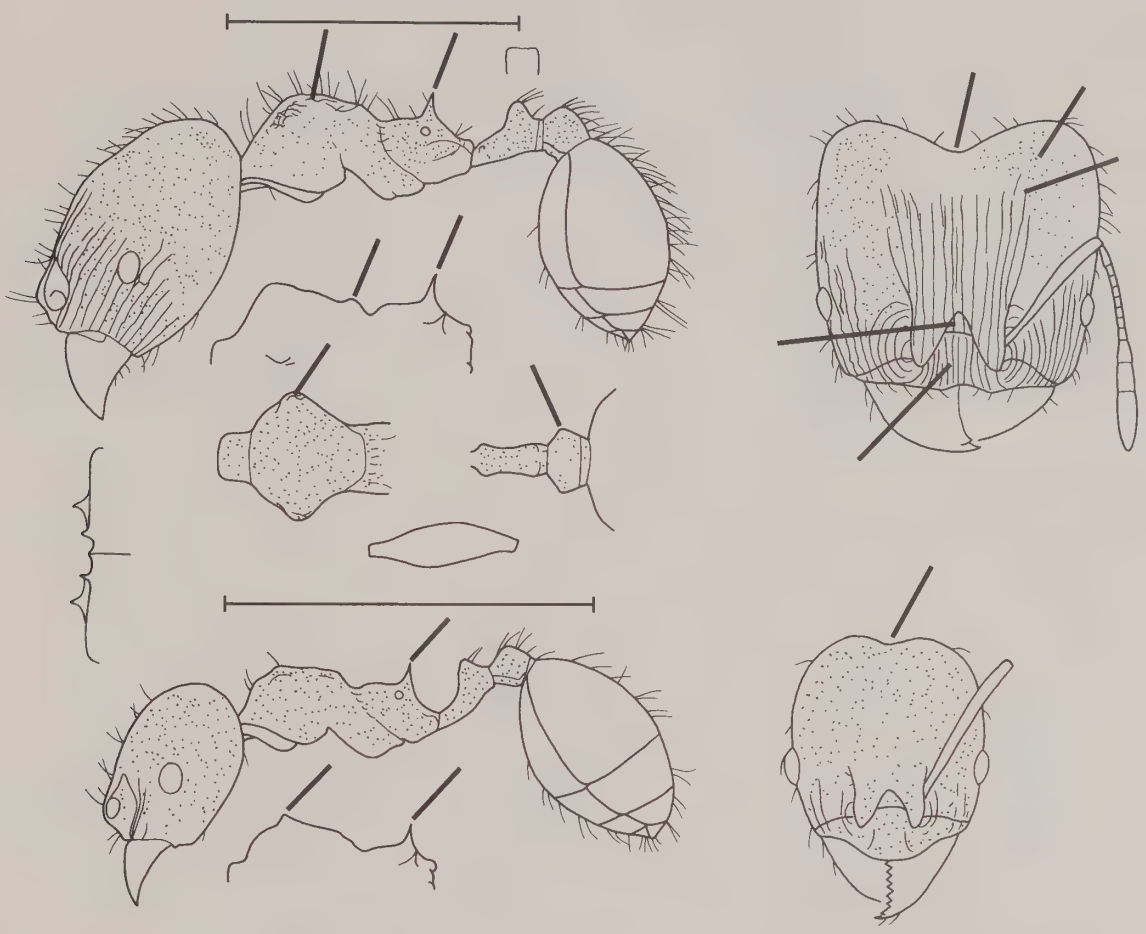
MEASUREMENTS (mm) Holotype major: HW 0.80, HL 0.80, SL 0.44, EL 0.10, PW 0.38.
Paratype minor: HW 0.40, HL 0.44, SL 0.42, EL 0.04, PW 0.24.

COLOR Major and minor: concolorous yellow.

RANGE Known from the type locality and from near Turrialba, Cartago Prov., Costa Rica, 550 m.

BIOLOGY Collected at a bait in a subterranean trap (W. P. MacKay).

FIGURE Upper: syntype, major. Lower: syntype, minor. BRAZIL: Colônia Alpina, Terasópolis, Rio de Janeiro (Emilio A. Goeldi). Scale bar = 1 mm.

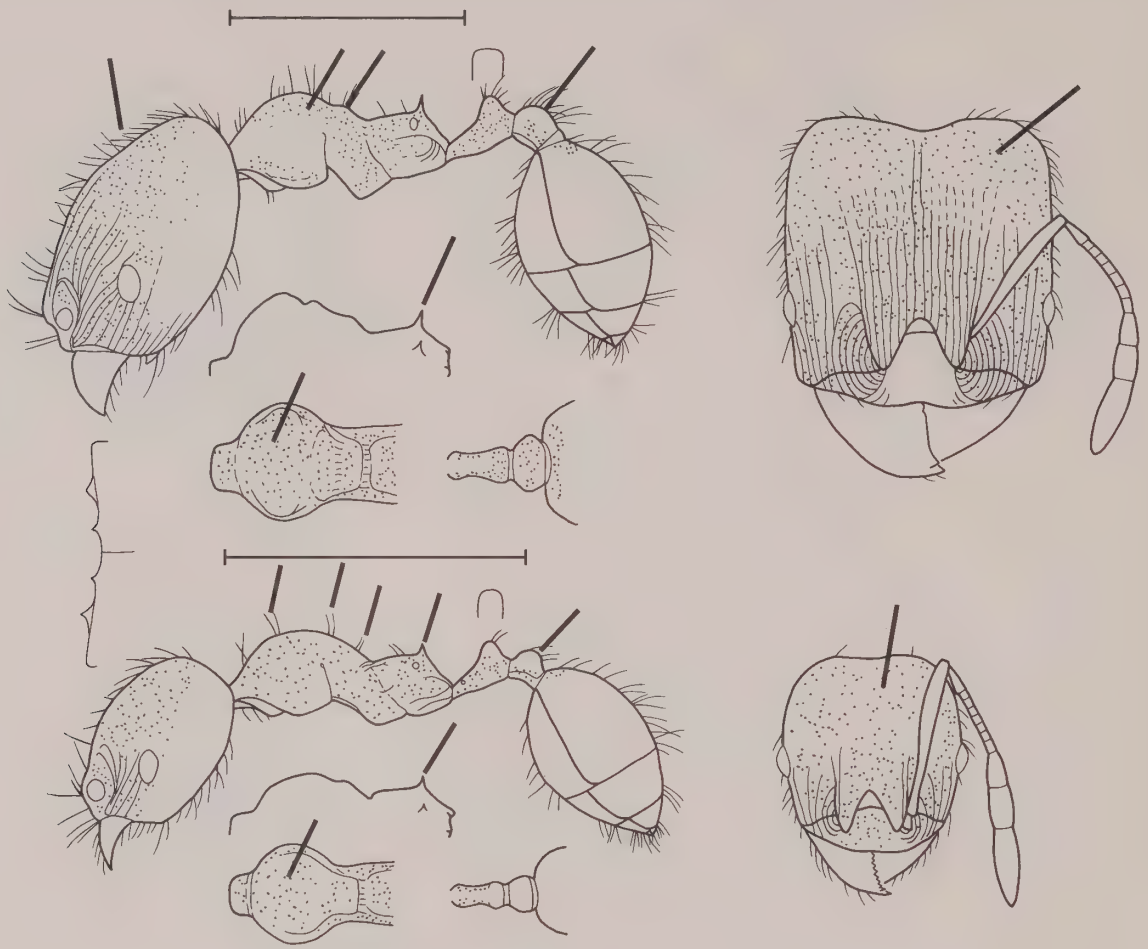


Pheidole goeldii Forel

Pheidole goeldii Forel 1895c:178.

TYPES Mus. Hist. Nat. Genève; Mus. Comp. Zool. Harvard.
ETYMOLOGY Named in honor of the collector Emilio A. Goeldi.
DIAGNOSIS A member of the *flavens* group, somewhat similar to *chloe* and *striaticeps* of Mexico and Central America, distinguished as follows.
Major: yellow; Head Width equal to Head Length; occipital cleft deep, with subangulate midline cleft; mesonotal convexity apparent in dorsal-oblique view; postpetiole from above diamond-shaped, with right-angular margins; edges of humeri rugoreticulate; propodeal spines half as long as and perpendicular to basal face of propodeum preceding them; edges of humeri rugoreticulate.
Minor: humeri toothed; propodeal spines more than a third as long as and perpendicular to the basal face of the propodeum facing them; occiput narrowed behind; occiput with prominent midline cleft; head, mesosoma, and waist foveolate and opaque.
MEASUREMENTS (mm) Syntype major: HW 1.00, HL 1.00, SL 0.48, EL 0.12, PW 0.48.
Syntype minor: HW 0.50, HL 0.54, SL 0.44, EL 0.08, PW 0.30.
COLOR Major and minor: concolorous yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Susumuco, Bogotá-Villavicencio, Cundinamarca, Km 88, 1100 m (William L. and Doris E. Brown). Scale bars = 1 mm.



Pheidole grex **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *grex,* herd or flock.

DIAGNOSIS A medium-sized, slender, yellow species placed in the *flavens* group (but with habitus intermediate to the *punctithorax* group), whose **major** has completely foveolate dorsum of the head (exclusive of central clypeus and frontal triangle) and mesosoma; carinulae limited to the anterior two-thirds of the head capsule; profile of the posterior half of the head flat in side view; relatively long, slender, nearly erect propodeal spines; low but distinct mesonotal convexity; and low postpetiolar node in side view.

Minor: foveolation as in major; sparse, paired hairs on mesonotal dorsum; and short, erect propodeal spines that curve forward. Somewhat similar to *humida,* but different in many details, as figured.

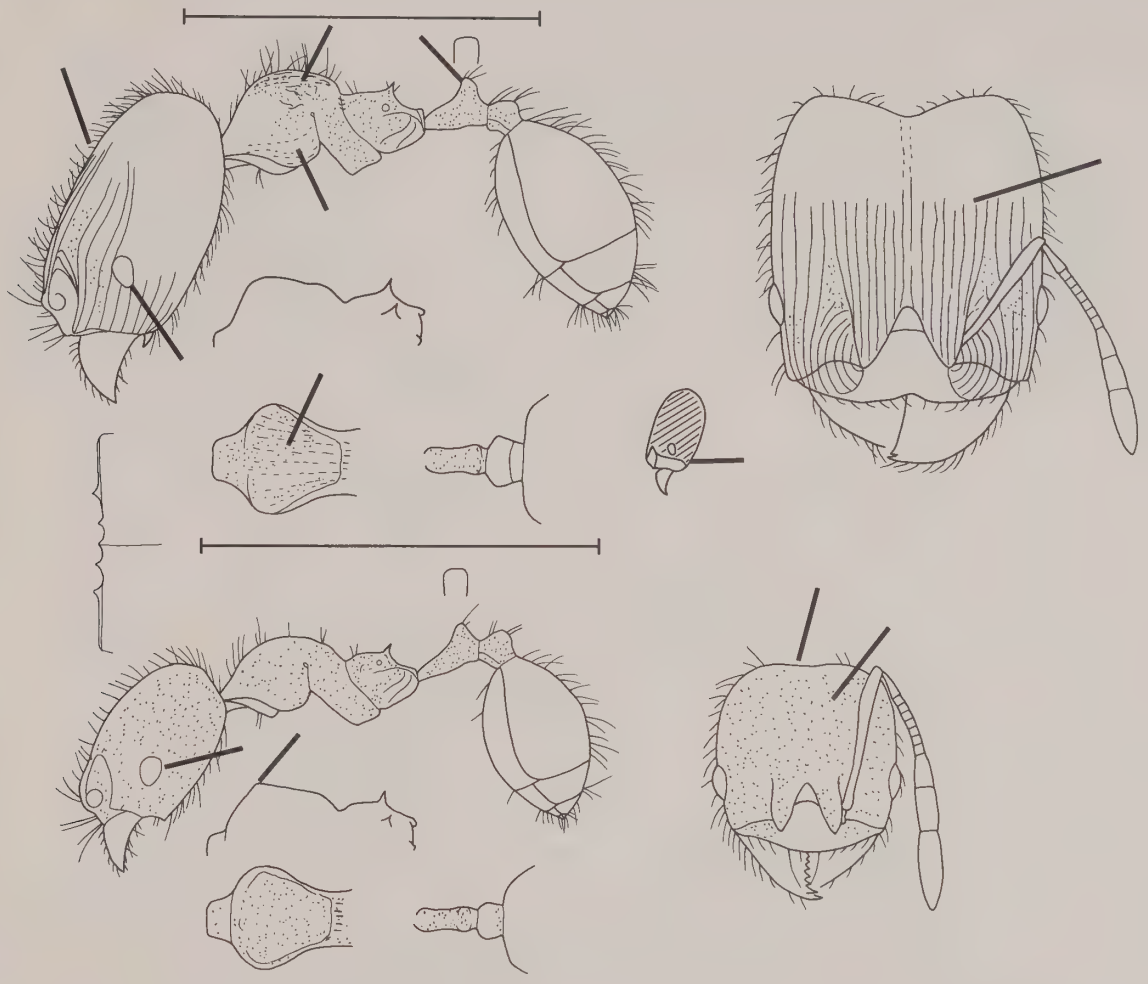
MEASUREMENTS (mm) Holotype major: HW 0.94, HL 1.08, SL 0.60, EL 0.16, PW 0.52.
Paratype minor: HW 0.54, HL 0.58, SL 0.52, EL 0.10, PW 0.16.

COLOR Major: concolorous dark yellow.
Minor: concolorous medium yellow.

RANGE Known from Cundinamarca and Meta provinces in Colombia.

BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Puente Bomba, near Dibulla, Guajira (William L. and Doris E. Brown). Scale bars = 1 mm.



Pheidole guajirana **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the northernmost region of Colombia, origin of the type series.

DIAGNOSIS Somewhat similar in various traits to the Nearctic species *casta, mera,* and *tysoni,* and easily distinguished as follows.

Major: posterior half of dorsal head profile flat; eye set well forward on head, pearl-shaped, with anterior end tapered slightly; head bicolored; dorsum of promesonotum covered with faint longitudinal carinulae, and foveolate; petiolar node tapered at apex; postpetiole from above diamond-shaped.

Minor: eye set well forward on head; occiput broad, its margin weakly concave; all of head, mesosoma, and petiole foveolate.

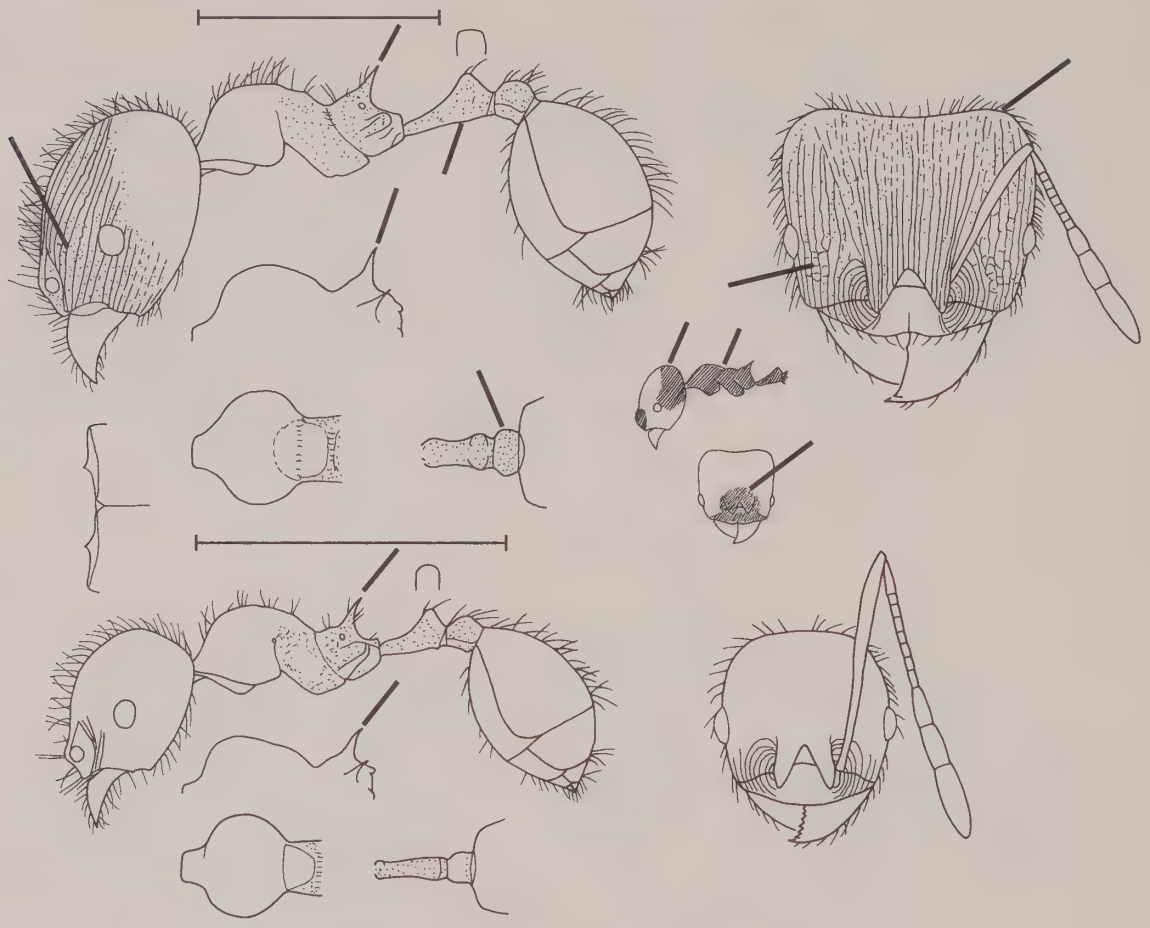
MEASUREMENTS (mm) Holotype major: HW 0.70, HL 0.78, SL 0.34, EL 0.10, PW 0.36.
Paratype minor: HW 0.40, HL 0.44, SL 0.32, EL 0.06, PW 0.26.

COLOR Major: most of body medium brown (mesosoma tending to dark brown), and anterior one-sixth of head capsule, and appendages, brownish yellow.
Minor: body medium brown, appendages brownish yellow.

RANGE Known from collections made at elevations to 200 m in several localities in Guajira and Magdalena, Colombia, as well as a series from the Caracaraí Road 20 km northeast of Manaus, Brazil.

BIOLOGY Found in or near rainforest, variously in sand and, in one instance, a rotten log in beach sand.

FIGURE Upper: holotype, major. Lower: paratype, minor. DOMINICAN REPUBLIC (GREATER ANTILLES): Hotel Nueva Sueza, Constanza, La Vega Prov., 1300 m (William L. and Doris E. Brown). Scale bars = 1 mm.



Pheidole harlequina **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY NL *harlequina* for harlequin, clown in multicolored, brightly patterned costume.

DIAGNOSIS Similar to *drepanon,* another unusual Dominican endemic, differing from it and all other *Pheidole* as follows.

Major: propodeal spine thick, curved slightly, and as long as the propodeal basal face anterior to it; body multicolored as depicted and described under Color below; head much broader than long, expanding posteriorly to maximum width at occiput; a small patch of rugoreticulum present between eye and antennal fossa on each side, and most of rest of dorsal surface of head carinulate; postpetiole from above oval.

Minor: multicolored, as described below; propodeal spines thick, curved, and as long as the propodeal basal face anterior to them.

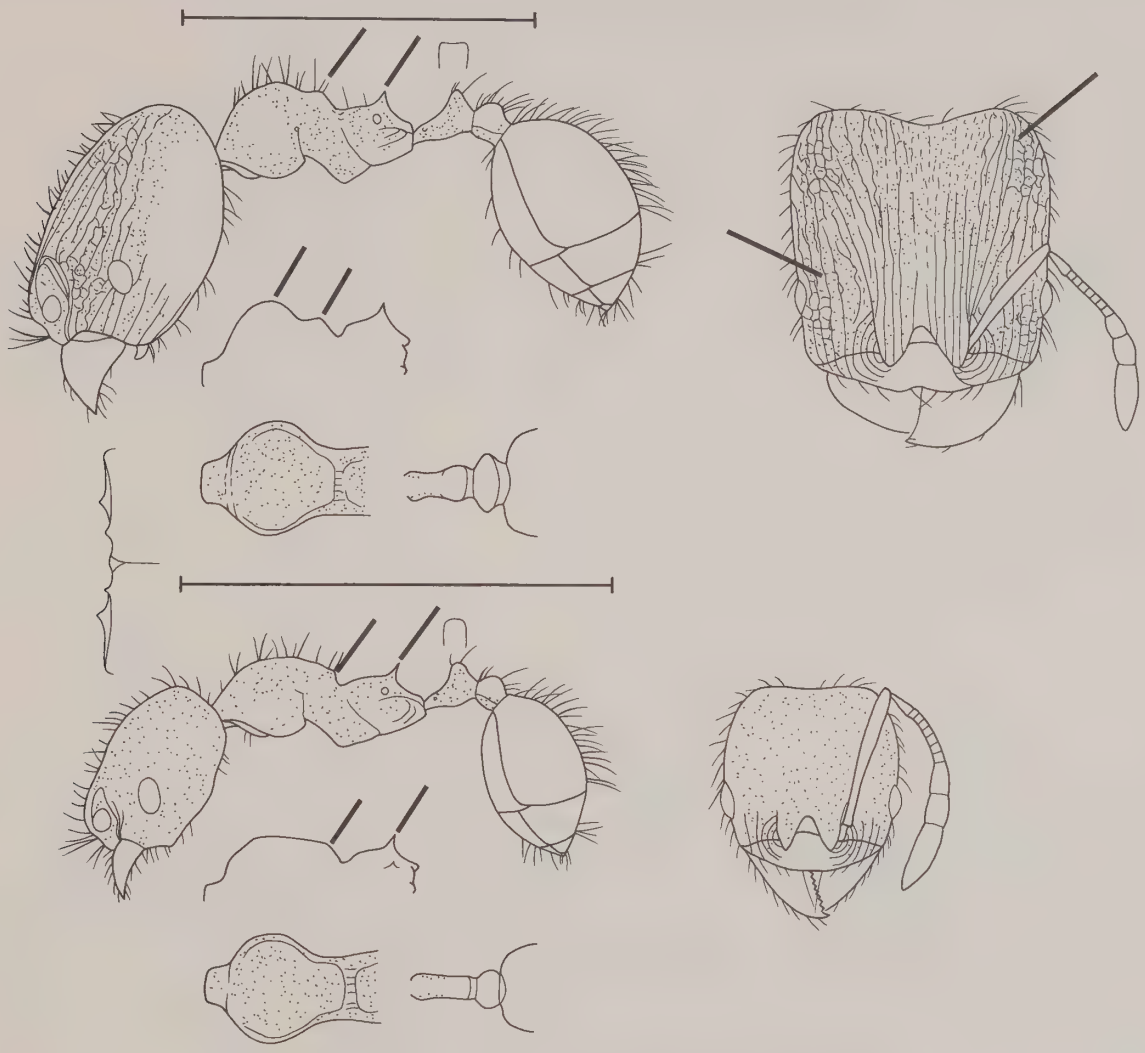
MEASUREMENTS (mm) Holotype major: HW 0.94, HL 0.90, SL 0.66, EL 0.14, PW 0.50.
Paratype minor: HW 0.50, HL 0.50, SL 0.62, EL 0.10, PW 0.34.

COLOR Major: multicolored; mesosoma and waist dark brown; posterior rear half of head, a large circular patch covering part of vertex, and all of frontal triangle and clypeus medium brown; and rest of body clear yellow.
Minor: head, mesosoma, and waist dark brown; gaster pale yellow; appendages light to brownish yellow.

RANGE Known only from the type locality. Evidently an endemic of the Dominican Republic, although it is to be looked for in Haiti as well. A second, similar species is known from a single minor collected in dry coastal scrub 3 km east of Tintero, San Pedros de Macoris, Dominican Republic (W. L. and D. E. Brown); it will not be described at this time.

BIOLOGY The type colony was found in a pine-hardwood ravine.

FIGURE Upper: holotype, major. Lower: paratype, minor. HONDURAS: El Sauce, Santa Bárbara, 700 m (William L. Brown). Scale bars = 1 mm.



Pheidole harrisonfordi **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named in honor of Harrison Ford, in recognition of his outstanding contribution in service and support to tropical conservation, hence the habitats in which the Pheidole ants will continue to exist.

DIAGNOSIS A small light-colored member of the *flavens* group similar to the species listed in the heading above, distinguished in the **major** by the bulbous pronotum in dorsal-oblique view, set off from a small but distinct mesonotal convexity, and the cephalic rugoreticulum, which starts as a patch at each occiput corner and runs anteriorly in a thin band to a patch just mesad to the eye. The **minor** is distinctive in the steep, nearly vertical descent of the posterior mesonotal face to the metanotum.

MEASUREMENTS (mm) Holotype major: HW 0.70, HL 0.80, SL 0.40, EL 0.08, PW 0.36.
Paratype minor: HW 0.40, HL 0.44, SL 0.34, EL 0.06, PW 0.26.

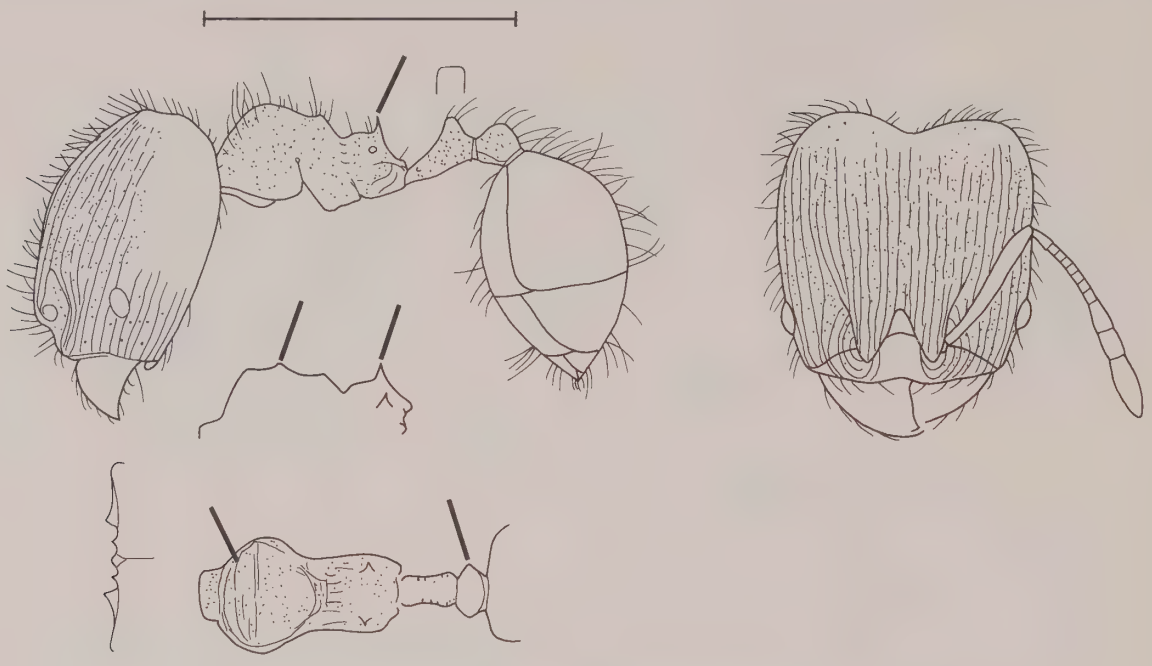
COLOR Major: body light reddish brown, appendages dark yellow.
Minor: concolorous light reddish yellow.

RANGE Known from the type locality, and from Belmopan, Belize (Stewart B. and Jarmila Kukalová-Peck).

BIOLOGY The type series was collected on a steep, rocky forested slope (W. L. Brown); the Belize ants were taken from the ground in a Cecropia-palm forest.

Compare with species listed
in the Diagnosis below

FIGURE Unique holotype, major. ECUADOR: Rio Palenque Station, 47 km south of Santo Domingo, Pachincha (Stewart B. and Jarmila Kukalová-Peck). Scale bar = 1 mm.



Pheidole hazenae **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named in honor of Anne-Eve Hazen, in recognition of her outstanding contribution in service and support to tropical conservation, hence the habitats in which the Pheidole ants will continue to exist.

DIAGNOSIS A medium-sized, yellow member of the *flavens* group, similar to *camilla* but differing in the **major** caste in the moderately convex profile of the head (not bulging as in *camilla*), exclusively carinulate (as opposed to partly rugulose and rugoreticulate) sculpturing of the dorsal head surface, and the vertical, forward-curving propodeal spine as viewed from the side. At 50–60× the tips of the mesosomal and gastral hairs are not flattened as in *camilla*.

Also similar in some features to *alticola, euryscopa, heterothrix, rectiluma, rectisentis, rectispina,* and *rectitrudis,* and notably different in others as illustrated.

Minor: not diagnosed.

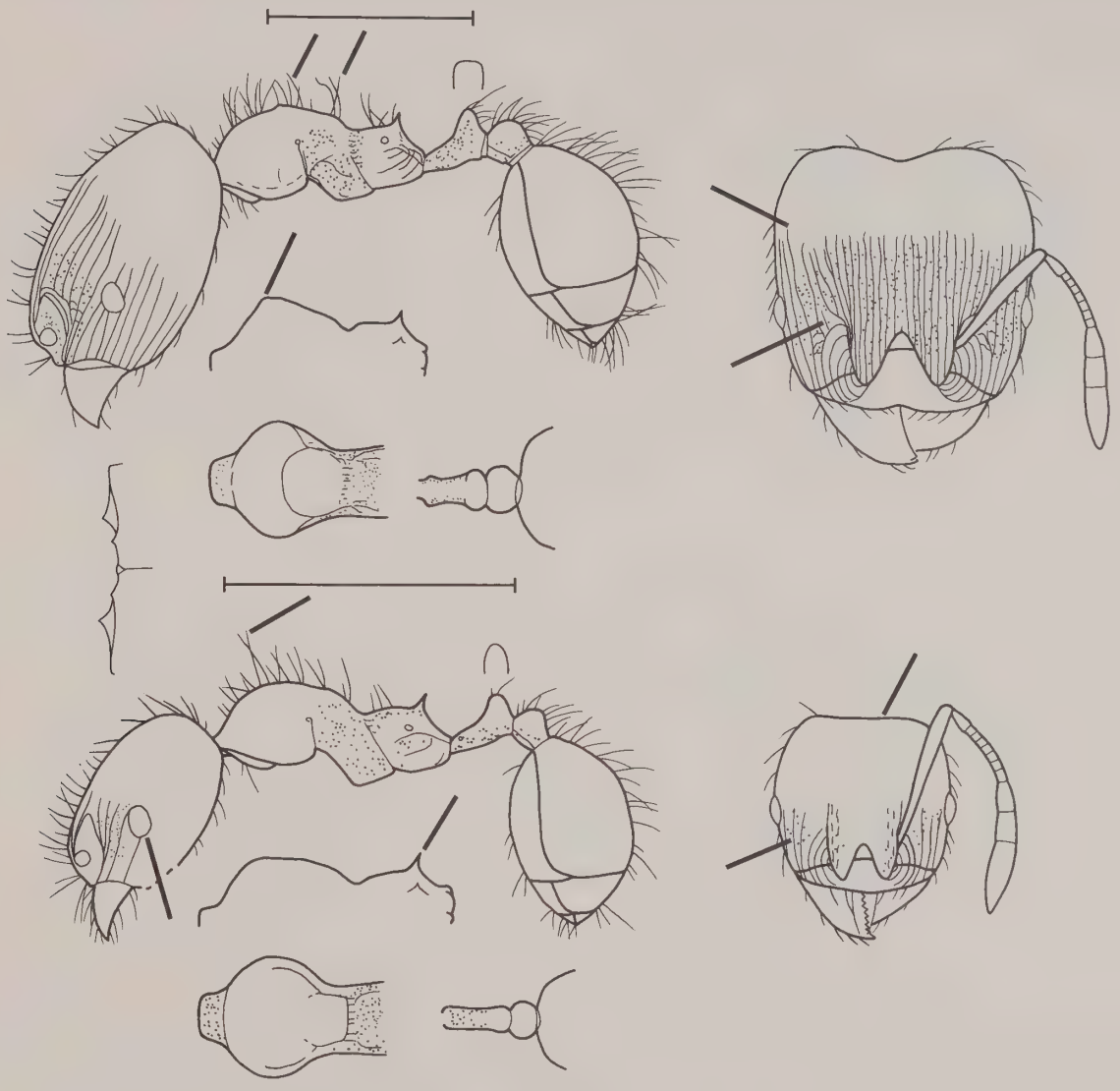
MEASUREMENTS (mm) Holotype major: HW 0.86, HL 0.90, SL 0.46, EL 0.10, PW 0.40.

COLOR Major: concolorous yellow.

RANGE Known only from the type locality and a single Colombian accession (Zona Buenos Aires, 600–800 m, Charles Kugler). In the second series the specimens are larger and darker than the type and may represent a distinct species.

BIOLOGY Zona Buenos Aires, Colombia: in second-growth forest.

FIGURE Upper: holotype, major. Lower: paratype, minor. VENEZUELA: Estado Aragua, Rancho Grande, 1100 m (William L. and Doris E. Brown). Scale bars = 1 mm.



Pheidole hedlundorum **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named in honor of Charles and Helen Marie Hedlund, in recognition of their outstanding contribution in service and support to tropical conservation, hence the habitats in which the Pheidole ants will continue to exist.

DIAGNOSIS A large, medium reddish brown (**major**) or plain light brown (**minor**) member of the *flavens* group, with a mostly smooth, shiny body surface and dense, exceptionally long pilosity. Similar to *lustrata,* differing in the **major** in lighter body color, larger size, rounded humerus in dorsal-oblique view, presence of wavy hairs on the promesonotum; and less extensive foveolation on the mesopleuron and propodeum; and in the **minor** in the broader occiput in full-face view, more posterior position of the eye, round eye shape, and shorter scape length.

See also the less similar *browni, chalca, chalcoides, terresi,* and species close to them listed in the diagnoses.

MEASUREMENTS (mm) Holotype major: HW 1.20, HL 1.20, SL 0.62, EL 0.14, PW 0.58.

Paratype minor: HW 0.60, HL 0.62, SL 0.58, EL 0.10, PW 0.40.

COLOR Major: body rich medium reddish brown, appendages a lighter shade.

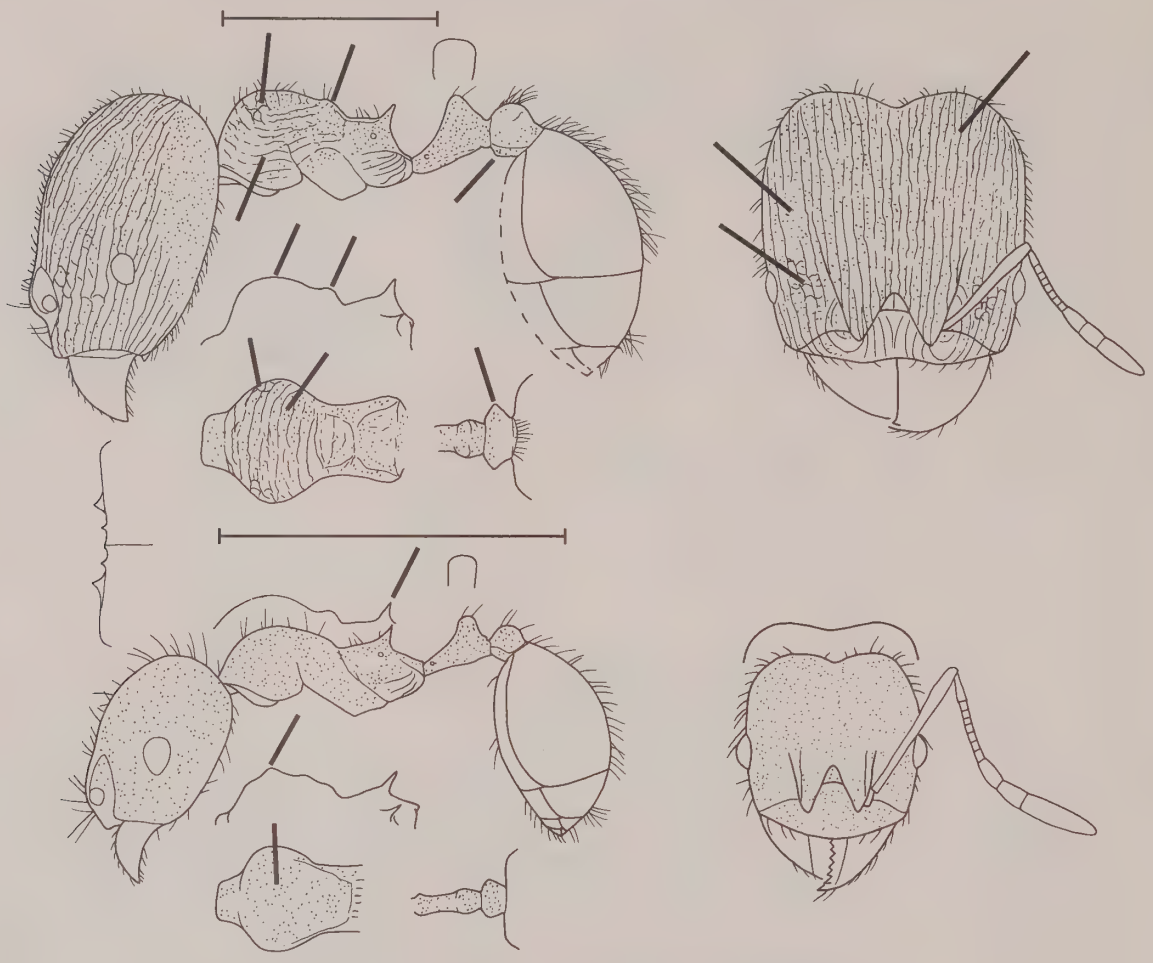
Minor: light brown, tarsi yellow.

RANGE Known only from the type series.

BIOLOGY Collected from leaf litter in wet montane forest.

Compare with *obtusopilosa*

FIGURE Upper: major (syntype of synonymous *gavrilovi*). Lower: minor (syntype of synonymous *gavrilovi*). ARGENTINA: Loreto, Misiones, Argentina. Compared with lectotype and paralectotype of *heterothrix*; upper outlines of minor mesosoma and occiput are those of *heterothrix* syntype. (Type locality of *heterothrix*: Villaguay, Entre Rios, Argentina.) Scale bars = 1 mm.

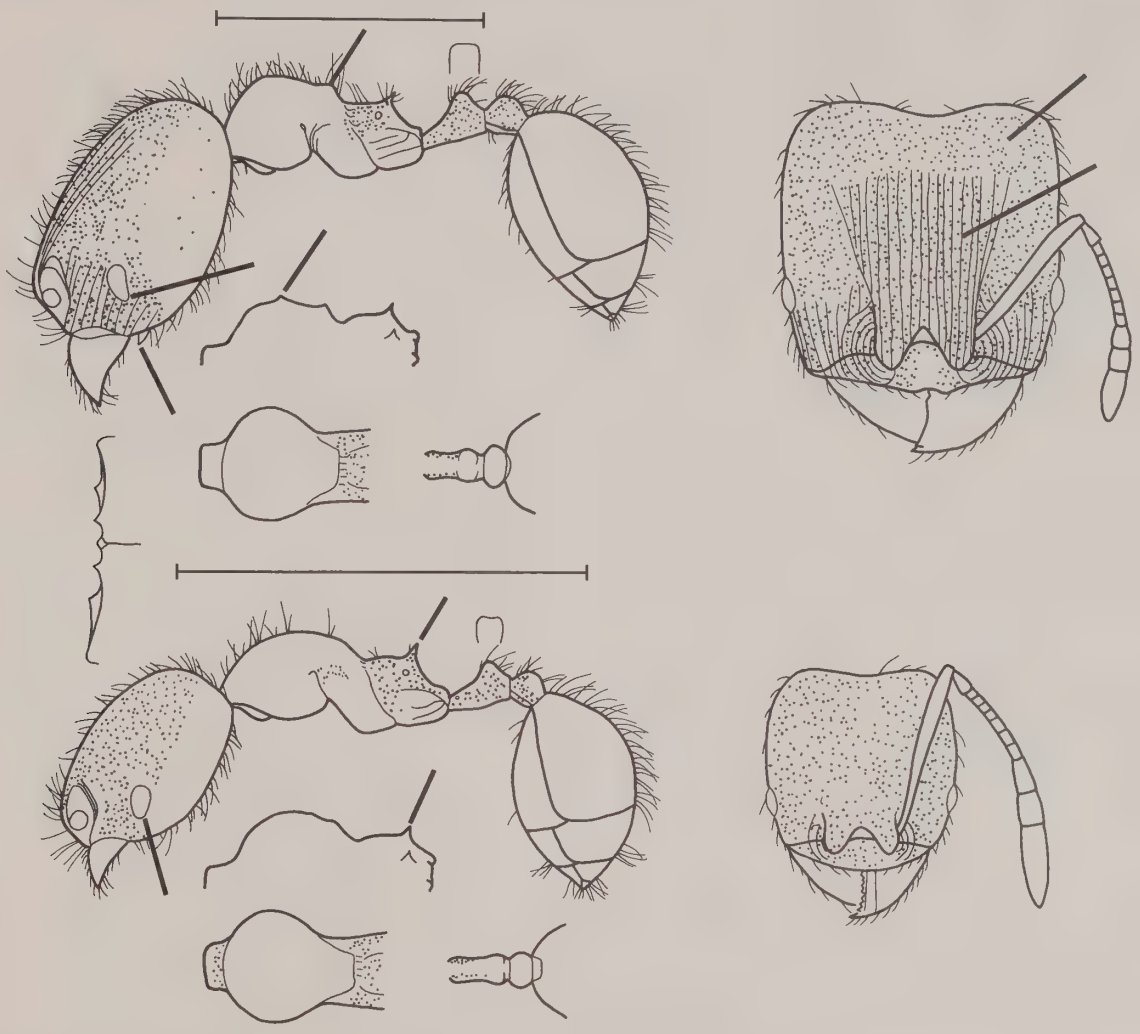


Pheidole heterothrix Santschi, **new status**

Pheidole obtusopilosa st. *heterothrix* Santschi 1923d: 59. Syn.: *Pheidole gavrilovi* Kusnezov 1952d: 80, n. syn.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY Gr *heterothrix,* different hair (from that of *obtusopilosa*).
DIAGNOSIS Similar to *obtusopilosa* in some traits but distinguished from it and other *Pheidole* species as follows.
Major: patch of rugoreticulum present between eye and antennal fossa on each side; entire remainder of dorsal surface of head, including occiput, carinulate; very faint antennal scrobe present; promesonotal profile smoothly rounded; mesonotal convexity low but with distinct anterior and posterior declivities; all of pronotum carinulate; humeri rugoreticulate; pilosity dense and short; postpetiole from above conulate.
Minor: humerus subangulate; propodeal spines robust, moderately long, and directed backward; all of body except gaster foveolate.
MEASUREMENTS (mm) Lectotype major (*heterothrix,* not *"gavrilovi"*): HW 1.12, HL 1.16, SL 0.54, EL 0.18, PW 0.62.
Paralectotype minor: HW 0.54, HL 0.54, SL 0.44, EL 0.10, PW 0.32.
COLOR Major: all of body light reddish brown except gaster, which is medium reddish brown.
Minor: body dark reddish brown, appendages medium reddish brown.
RANGE In addition to the types, from Villaguay, Entre Rios, Argentina, I have seen series from the Argentine provinces of La Pampa, Misiones, and Tucumán.
BIOLOGY One series, collected by W. L. Brown at Horco Molle, Tucumán, was found at 900–1150 m in myrtaceous forest.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: 2.5 km northwest of Santa Elena, Puntarenas Province, 10°20′N 84°50′W, 1500 m (R. Burtoft). Scale bars = 1 mm.

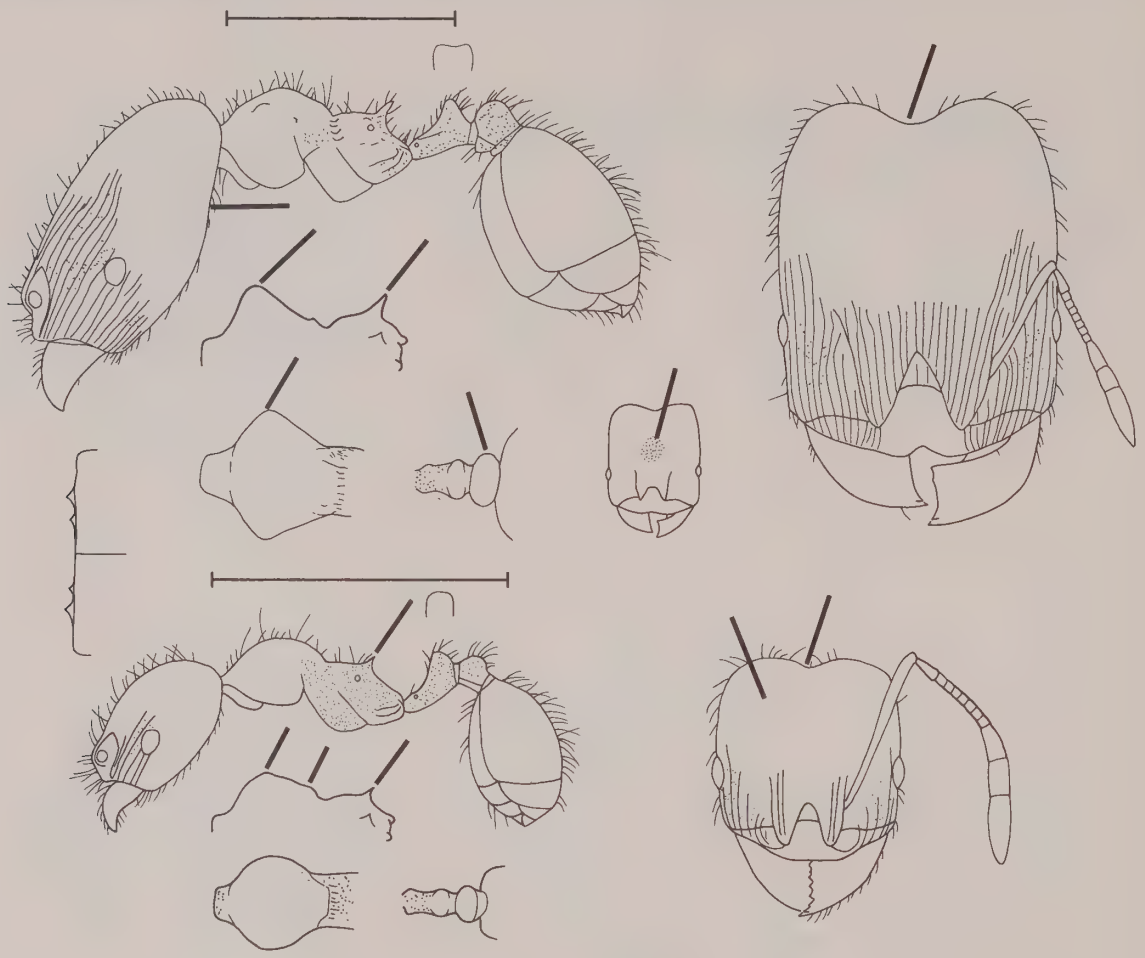


Pheidole hizemops **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *hizema,* sinking, and *ops,* eye.
DIAGNOSIS A small species sharing some traits, especially a moderately prominent mesonotal convexity, with *kuna, micon, tayrona,* and *tenebra* of Mexico, Central America, and Colombia, and less so with *breviseta, bruchella,* and *lignicola* of Argentina and southern Brazil, but differing in details of sculpturing as shown, and especially in the eye of the major, which is placed farther forward on the head and has a concave posterior border.
MEASUREMENTS (mm) Holotype major: HW 0.70, HL 0.76, SL 0.44, EL 0.14, PW 0.44.
Paratype minor: HW 0.50, HL 0.54, SL 0.42, EL 0.10, PW 0.32.
COLOR Major: waist and gaster light brown; rest of body and appendages reddish yellow ("orange"), with tarsi medium yellow.
Minor: reddish yellow ("orange").
RANGE Mountain forests of west-central Costa Rica, 1300–1600 m (Longino 1997).
BIOLOGY Specimens, some at baits, were recovered from leaf litter in montane rainforest.

Compare with *furtiva, mera, tysoni*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. TEXAS: Corsicana, Navarro Co., near Dallas-Ft. Worth (Mary Cooper). Scale bars = 1 mm.

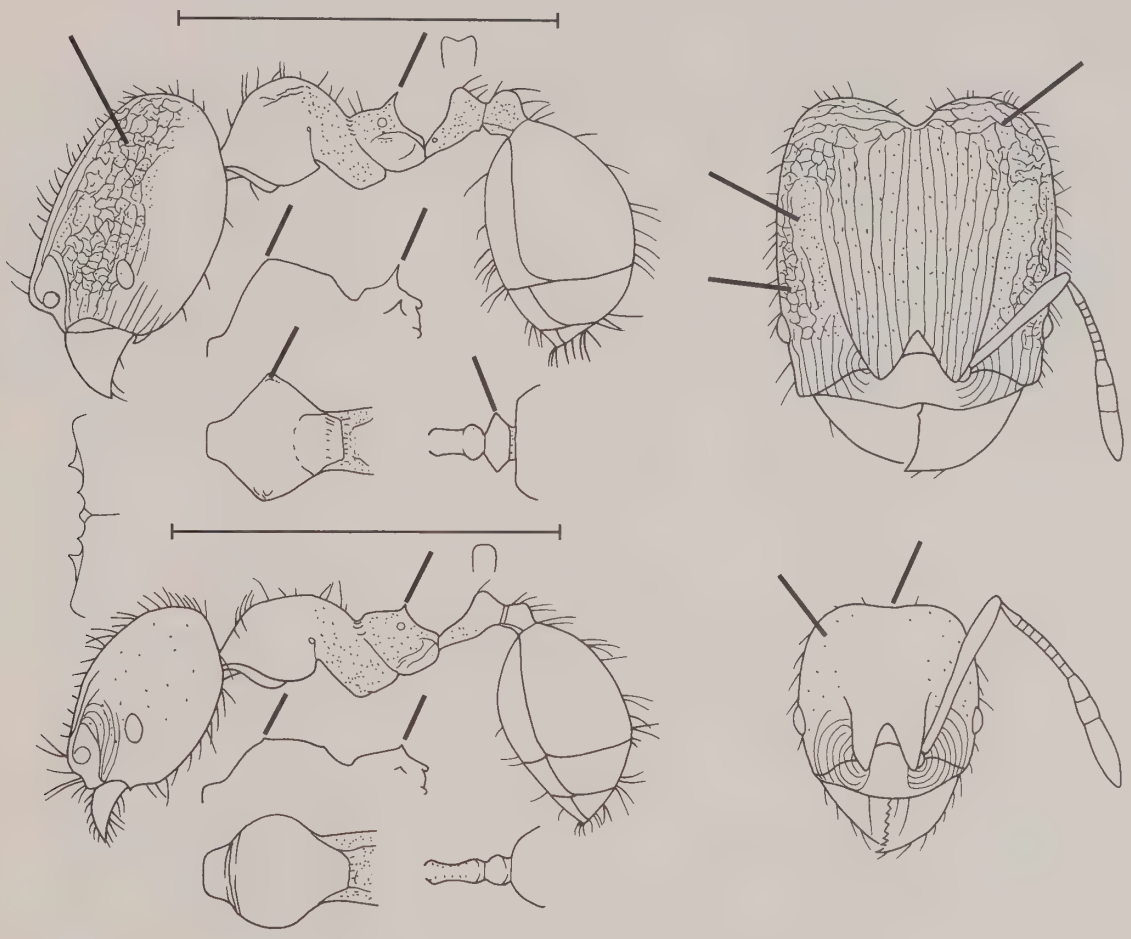


Pheidole humeralis Wheeler

Pheidole humeralis Wheeler 1908h: 456.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *humeralis,* of the shoulder, alluding to the elevated humerus of the major.
DIAGNOSIS Similar in some traits to *furtiva, mera,* and *tysoni,* differing as follows.
Major: reddish yellow, with pale brown spot on vertex; head elongate, its posterior ventral profile flat; humeri strongly developed and subangulate, in dorsal view overhanging the rest of the pronotum beneath them and in dorsal-oblique view extending more than 4× higher above the metanotal groove than the mesonotal convexity; propodeal spines robust, as long as half the propodeal basal face preceding them; postpetiole from above oval.
Minor: posterior half of head and all of pronotum smooth and shiny; in dorsal-oblique view, humerus subangulate and promesonotal profile behind it flat before dropping to metanotal groove; occiput broad, its margin strongly concave.
MEASUREMENTS (mm) Holotype major: HW 1.02, HL 1.28, SL 0.52, EL 0.12, PW 0.60.
Paratype minor: HW 0.50, HL 0.52, SL 0.46, EL 0.08, PW 0.32.
COLOR Major: body and appendages medium reddish yellow except for pale brown spot on vertex and yellowish brown gaster. Minor: body medium brown, appendages yellowish brown.
RANGE Known only from the type locality and western Texas (Moody and Francke 1982).
BIOLOGY *P. humeralis* is evidently a rare species. During their intensive collecting in western Texas, Moody and Francke (1982) found the species only once, four colonies in Kinney County at 220 meters nesting in open clayey soil.

FIGURE Upper: holotype, major. Lower: paratype, minor. BOLIVIA: Parque Nacional Noel Kempff Mercado, 14°48′S 60°23′W, 700 m (Philip S. Ward). Scale bars = 1 mm.

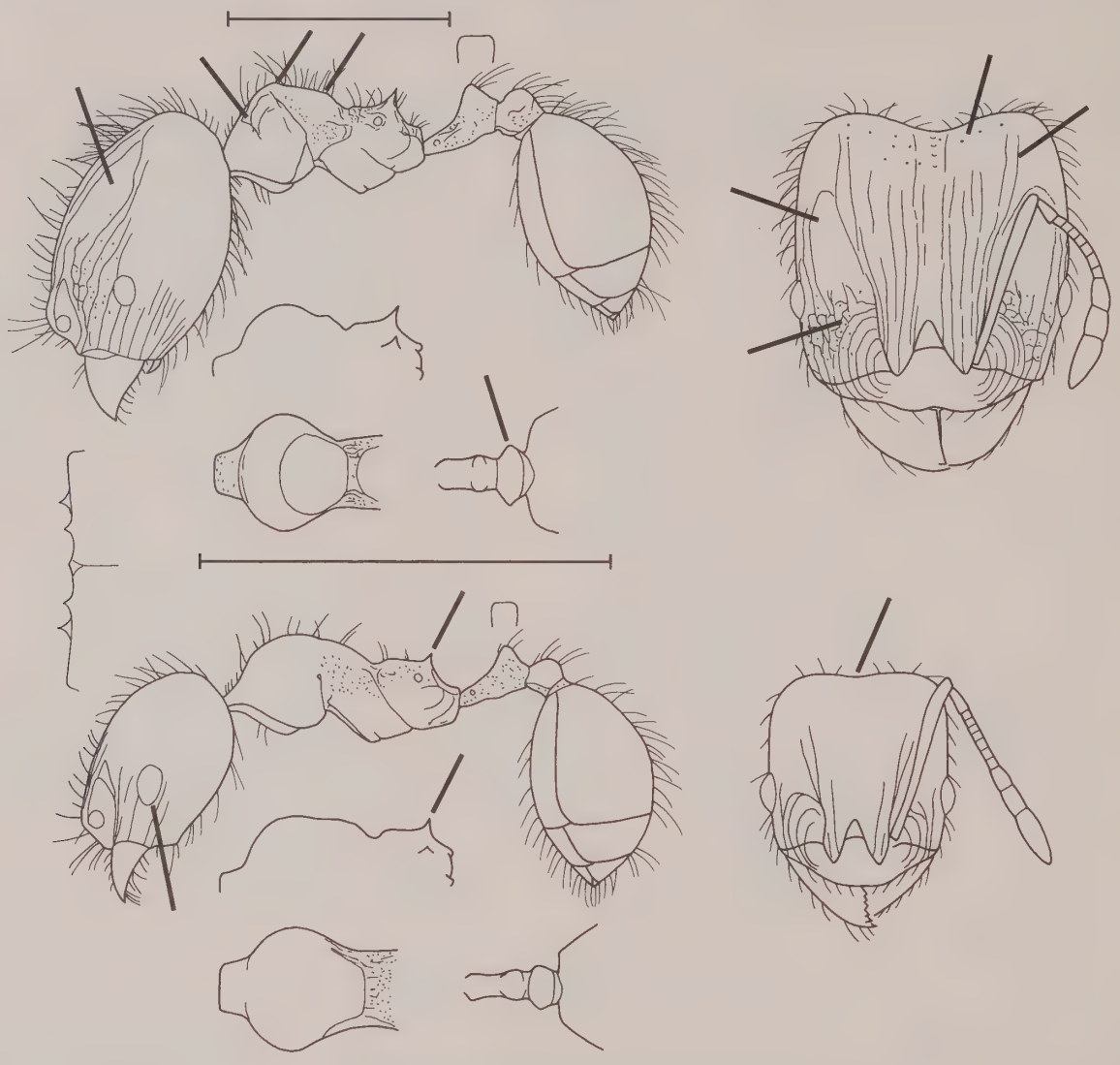


Pheidole infernalis **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *infernalis,* from the lower regions.
DIAGNOSIS Similar to the species listed in the heading above, differing as follows.
Major: shallow antennal scrobe present; occipital lobes and a broad swath running down the sides of the head from occiput to near the anterior genal border rugoreticulate; most of the rest of the head carinulate; humeri angulate, their tips rugoreticulate, and the rest of the promesonotal dorsum smooth; propodeal spines half as long as the propodeal basal face; postpetiole from above conulate.
Minor: sides of head feebly foveolate; head and pronotum mostly smooth and shiny; occiput broad and feebly concave; humerus in dorsal-oblique view denticulate; propodeal spines reduced to denticles.
MEASUREMENTS (mm) Holotype major: HW 0.72, HL 0.74, SL 0.36, EL 0.08, PW 0.38.
Paratype minor: HW 0.48, HL 0.52, SL 0.44, EL 0.06, PW 0.30.
COLOR Major: body brownish yellow except for dorsal surface of head, which is medium brown.
Minor: body dark yellow, appendages medium yellow.
RANGE Known only from the type locality.
BIOLOGY The types were sifted from rotting wood and mold on the floor of rainforest (P. S. Ward).

Compare with *chalca, mera, neolongiceps*

FIGURE Upper: holotype, major. Lower: paratype, minor. ARIZONA: 11 km west-northwest of Montezuma Pass, Huachuca Mts., Cochise Co., 1660 m (Stefan Cover). Scale bars = 1 mm.



Pheidole juniperae **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the prevailing tree of the type locality habitat.

DIAGNOSIS Similar in various traits to *chalca* of Mexico, *mera* of Texas, and *neolongiceps* of Cuba, differing as follows.

Major: yellow; shallow antennal scrobe present; carinulae originating on frontal lobes travel posteriorly all the way to but not across the occiput, which is smooth and sprinkled with foveae; space between eye and antennal fossa on each side of head rugoreticulate; almost all of mesosoma smooth and shiny; center of promesonotal dorsum in side view flat; postpetiole from above elliptical, with angulate lateral margins.

Minor: eye large, Eye Length almost a fourth of Head Width, and nearly as long as distance from eye to anterior clypeal margin; occiput very broad, its margin weakly concave; propodeal spines small, in side view equilaterally triangular.

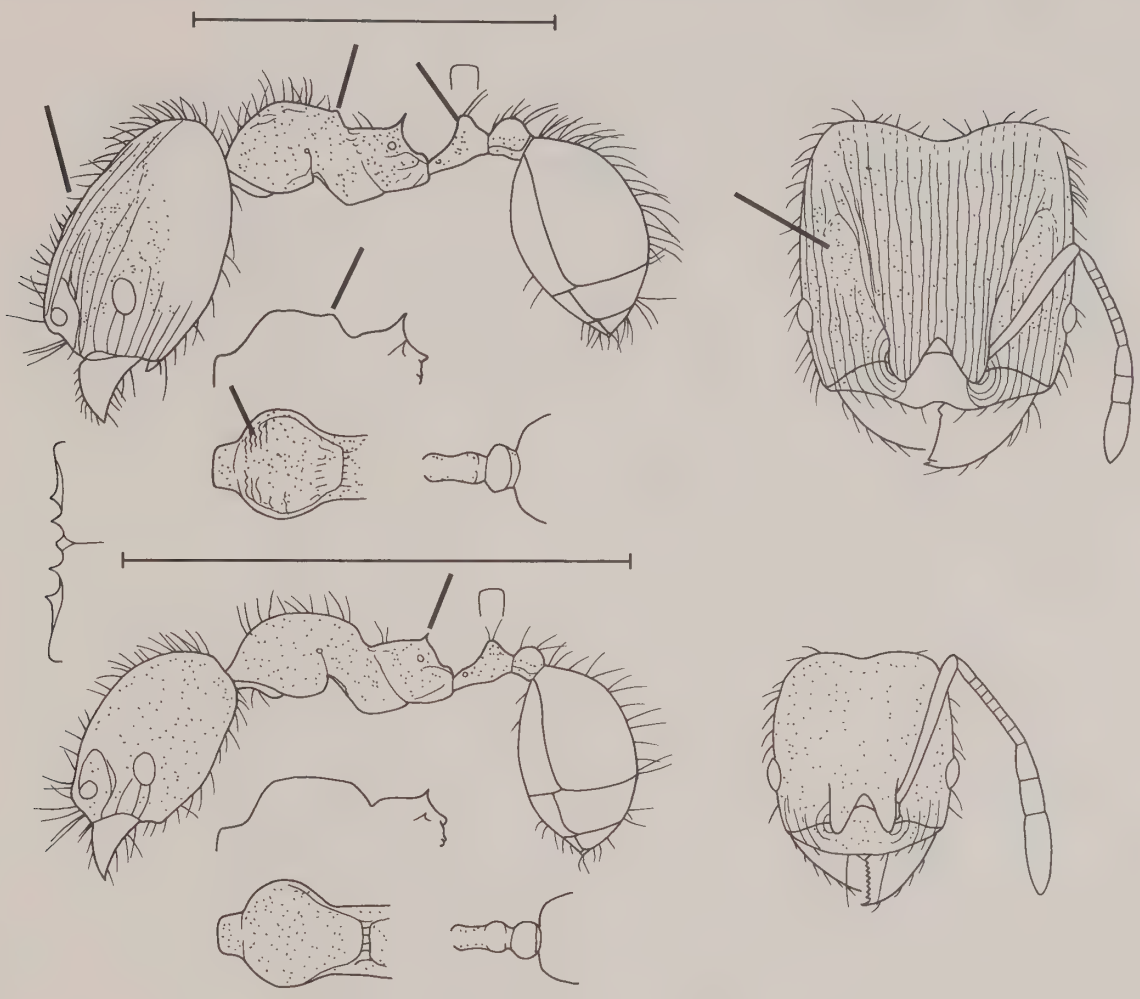
MEASUREMENTS (mm) Holotype major: HW 0.80, HL 0.94, SL 0.42, EL 0.14, PW 0.50.
Paratype minor: HW 0.44, HL 0.46, SL 0.38, EL 0.08, PW 0.26.

COLOR Major: concolorous medium yellow, with mandibles a slightly darker shade.
Minor: concolorous medium yellow.

RANGE Known from several collections at the type locality at 1660–1675 m.

BIOLOGY The species was found by Stefan Cover in juniper-oak-pinyon savanna with a grassy understory. The nest openings were cryptic and in most cases surmounted by a minute turret of vegetable fibers. No seeds were found in the nests.

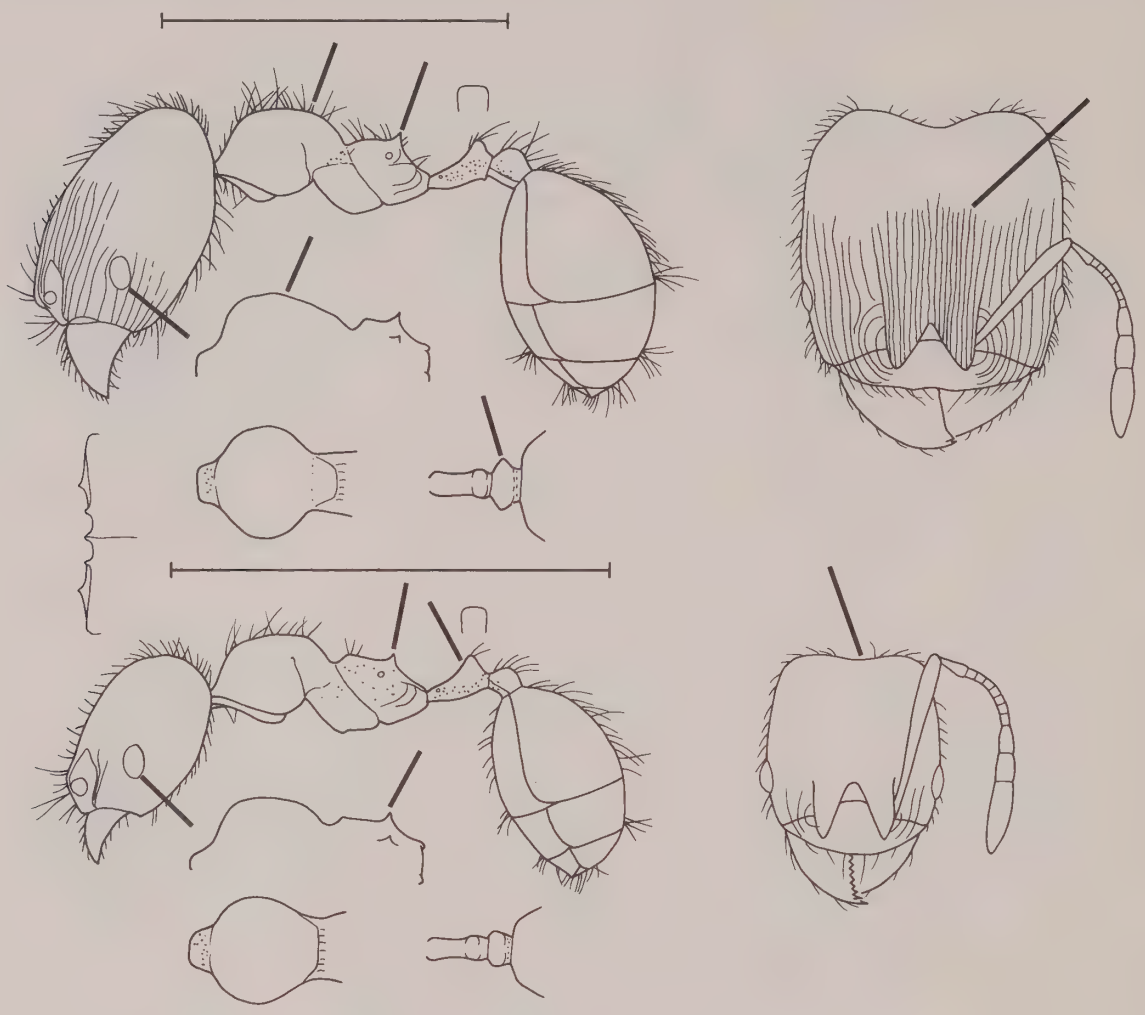
FIGURE Upper: holotype, major. Lower: paratype, minor. PANAMA: Nusagandi, San Blas Province (Leeanne E. Tennant-Alonso). Scale bars = 1 mm.



Pheidole kuna **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Kuna, Amerindian tribe of the San Blas region.
DIAGNOSIS A very small, bicolorous member of the *flavens* group close to *flavens,* with which it may be synonymous, and *tayrona,* distinguished from both in the **major**, which has a distinctive bicolorous body and angulate mesonotum. See also *breviseta, hizemops, lignicola, micon,* and *tenebra*.
MEASUREMENTS (mm) Holotype major: HW 0.68, HL 0.74, SL 0.40, EL 0.08, PW 0.34.
Paratype minor: HW 0.36, HL 0.40, SL 0.34, EL 0.06, PW 0.24.
COLOR Major and minor: gaster and postpetiole light brown; rest of body and appendages reddish yellow.
RANGE Known only from the type series.
BIOLOGY In rainforest.

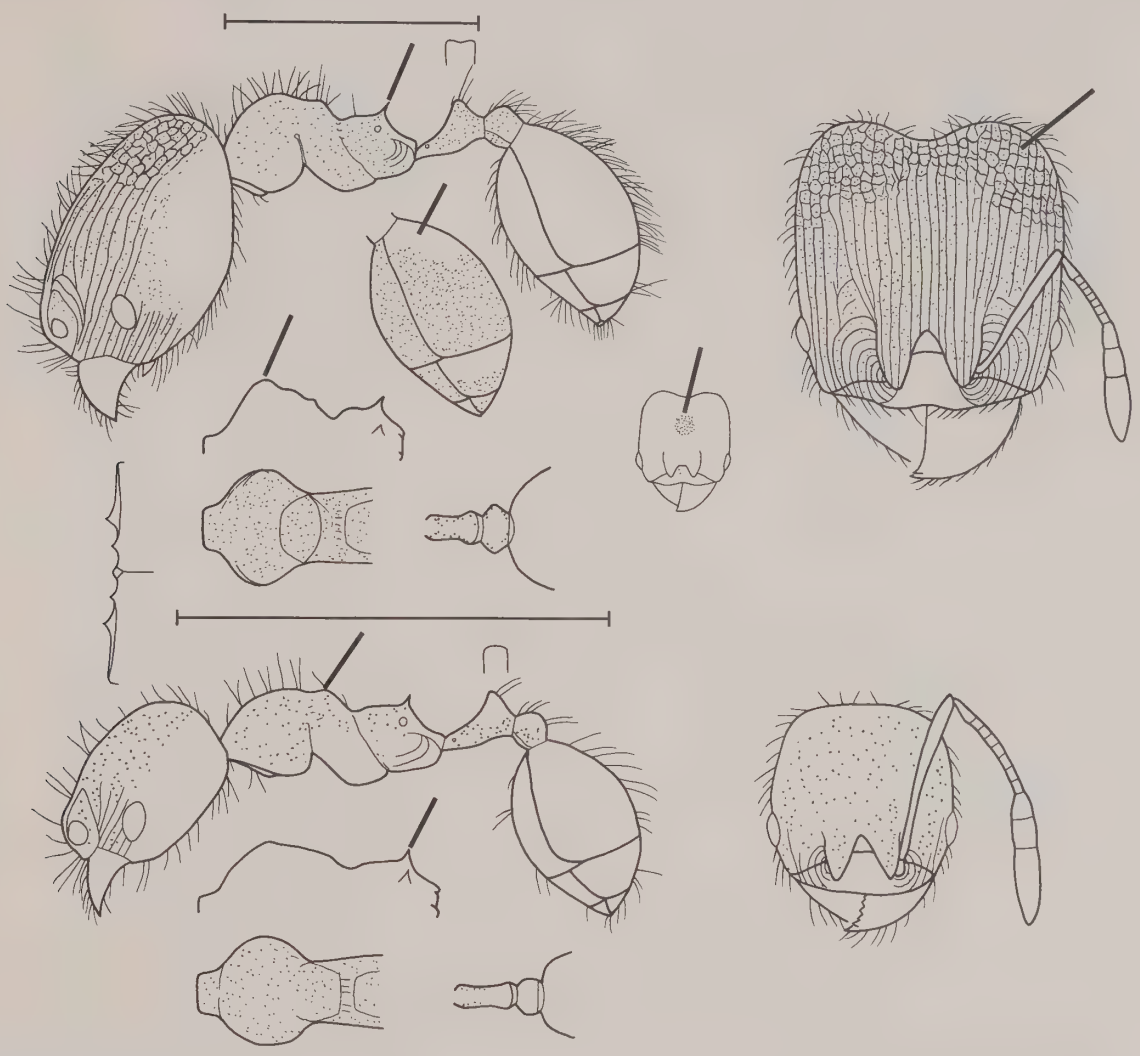
FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (Stefan Cover). Scale bars = 1 mm.



Pheidole laselva **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the type locality.
DIAGNOSIS Close to and possibly synonymous with *ebenina,* also similar in various traits to *albipes, amabilis, alticola, browni, crinita, delicata, euryscopa, hedlundorum, lustrata, mallota, melastomae, monteverdensis,* and *tillandsiarum,* differing as follows.
Major: carinulae on dorsal surface of head covering only half to two-thirds the anterior dorsal surface of the head; remainder of head, all of mesosoma, and dorsum of waist smooth and shiny; eye set well forward on head, so that the anterior margin is only about an Eye Length from the anterior genal margin; promesonotal profile a single smooth curve; propodeal spine small, equilaterally triangular; postpetiole from above elliptical, with angular lateral margins.
Minor: eye large, set well forward on the head; head and body almost completely smooth and shiny; propodeal pine small, equilaterally triangular; occiput broad, moderately concave.
MEASUREMENTS (mm) Holotype major: HW 0.72, HL 0.80, SL 0.40, EL 0.10, PW 0.38.
Paratype minor: HW 0.38, HL 0.42, SL 0.36, EL 0.08, PW 0.26.
COLOR Major: body and antennal scape concolorous medium brown; legs medium yellow; other appendages brownish yellow.
Minor: body and appendages brownish yellow ("tan") except for gaster, which is medium brown.
RANGE Widespread over the Atlantic lowlands and mid-Atlantic slopes of Costa Rica (Longino 1997). I have also seen material from Providencia and Valle, Colombia; Aragua, Venezuela; and Guayas, Ecuador.
BIOLOGY An inhabitant of litter on the floor of mature rainforest. Nests have been found in rotting logs and other pieces of dead wood (Longino 1997), as well in soil (S. Cover). Winged reproductives have been found in nests at the La Selva Biological Station in January and March, and in Ecuador in late July.

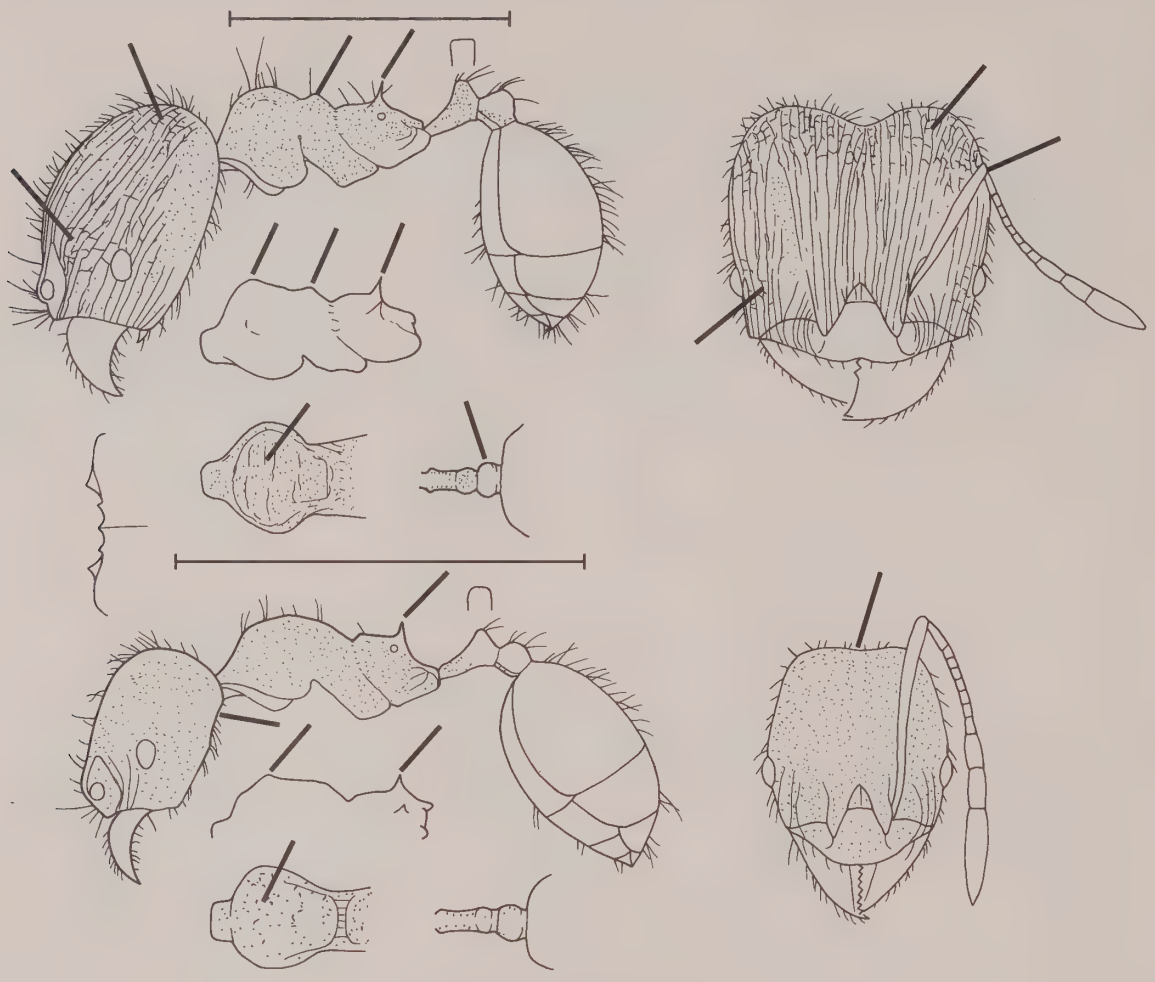
FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: on a ridge, Finca Los Guaduales, 10 km southwest San José del Palmar, Rio Torito, Chocó (C. Kugler). Scale bars = 1 mm.



Pheidole lemnisca **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *lemnisca,* ribbon or band, referring to the transverse color stripes on the gaster.
DIAGNOSIS Similar to species listed in the heading above, distinguished as follows.
Major: unique color pattern (see Color below); needle-like propodeal spine; prominent humeral lobe; and small but distinct mesonotal convexity.
MEASUREMENTS (mm) Holotype major: HW 0.70, HL 0.74, SL 0.36, EL 0.10, PW 0.40.
Paratype minor: HW 0.42, HL 0.42, SL 0.40, EL 0.10, PW 0.26.
COLOR Major: all yellow except for a conspicuous light brown transverse stripe along the rear border of each gastral tergite and a contrasting light brown circular spot on the vertex.
Minor: concolorous yellow.
RANGE Known only from the type series.
BIOLOGY Males were collected with the type colony, 1–4 June.

FIGURE Upper: major, compared with lectotype. Lower: minor, compared with paralectotype. BRAZIL: Caraguatatuba, São Paulo (W. L. Brown). (Type locality: Santa Catarina, Brazil.) Scale bars = 1 mm.

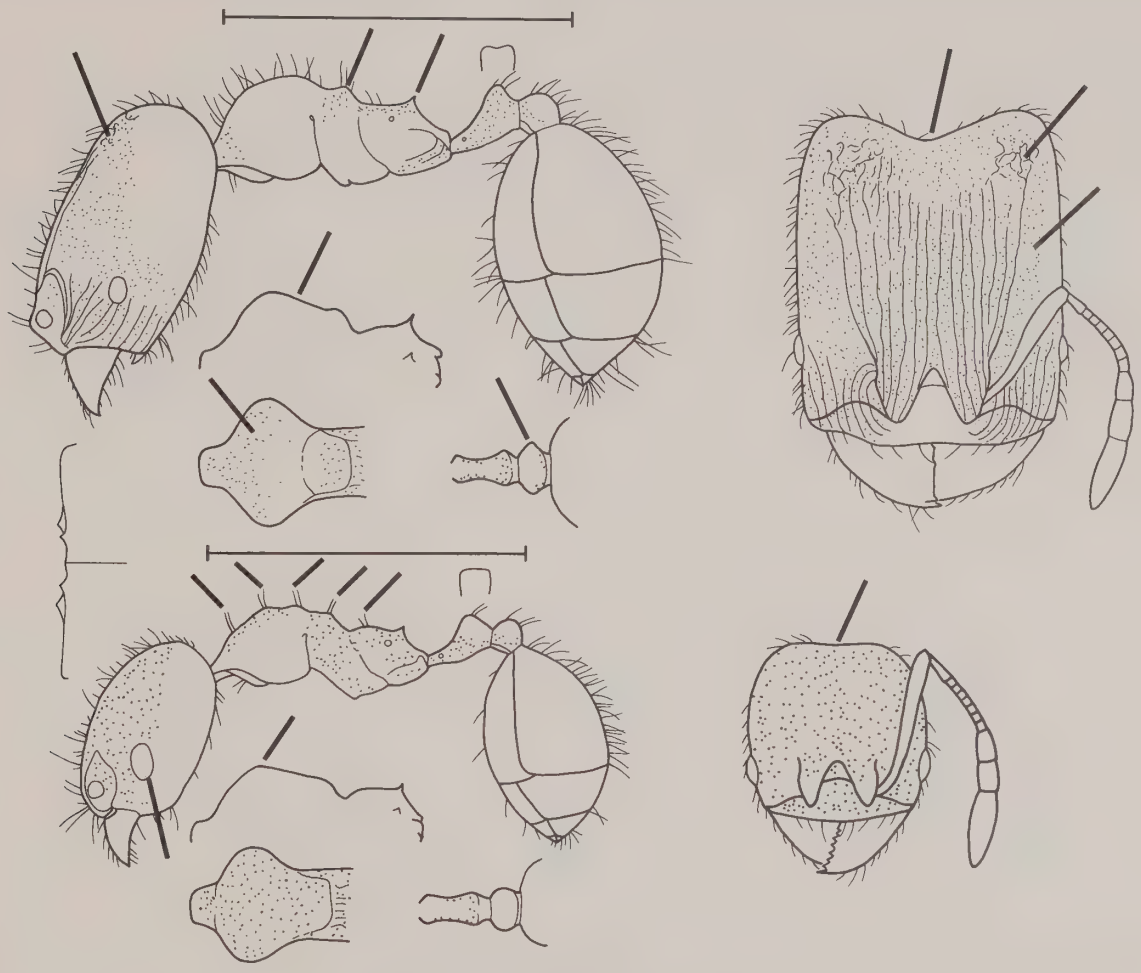


Pheidole lignicola Mayr

Pheidole lignicola Mayr 1887: 586. Syn.: *Pheidole lignicola* var. *levocciput* Forel 1908h: 370, n.syn. Raised to species level in this monograph: *bruchella, victima*.

TYPES Naturhist. Mus. Wien.
ETYMOLOGY L *lignicola,* dwelling in wood.
DIAGNOSIS Similar in various traits to the species listed in heading above, distinguished as follows.
Major: yellowish brown; occiput and space between eye and antennal fossa on each side rugoreticulate; most of rest of dorsal surface of head carinulate; antennal scape relatively long, its tip touching the sides of the head just posterior to the midpoint between the eye and level of the occipital lobe; mesonotal convexity well defined both anteriorly and posteriorly; humerus, in dorsal-oblique view low and smoothly rounded; propodeal spine moderately long and thin; postpetiole from above narrow and oval; almost all of body except gaster foveolate.
Minor: posterior half of venter of head in profile weakly concave; humerus in dorsal-oblique view subangulate; propodeal spine vertical to propodeal basal face; occiput slightly narrowed, its margin weakly concave, and nuchal collar absent. Almost all of head and mesosoma foveolate and opaque.
MEASUREMENTS (mm) Lectotype major: HW 0.88, HL 0.90, SL 0.56, EL 0.10, PW 0.44.
Paralectotype minor: HW 0.42, HL 0.52, SL 0.50, EL 0.06, PW 0.30.
COLOR Major: medium yellowish brown.
Minor: light yellowish brown.
RANGE Recorded from Buenos Aires, Argentina; San Bernardino and Jejuimi, Paraguay; and São Paulo and Santa Catarina states, Brazil.
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: 6.5 km east of Monteverde, Alajuela, 950 m (John T. Longino). Scale bars = 1 mm.



Pheidole longinoi **new species**

TYPES INBio.

ETYMOLOGY In honor of the collector John T. (Jack) Longino, pioneer explorer of the Costa Rican ant fauna.

DIAGNOSIS A small, medium yellow member of the *flavens* group, most similar to *otisi* and *prolixa* but easily distinguished from them in the **major** by the more prominent mesonotal convexity; smaller, more posteriorly directed propodeal spines; postpetiolar shape; and many details of cephalic sculpturing, including absence of rugoreticulum in the center of the occiput.

The **minor** also differs in having the pilosity on the mesosomal dorsum limited to evenly spaced pairs of hairs.

P. longinoi is also similar but less so to *ceibana, ruida,* and *sospes*.

MEASUREMENTS (mm) Holotype major: HW 0.66, HL 0.82, SL 0.42, EL 0.08, PW 0.38.

Paratype minor: HW 0.40, HL 0.44, SL 0.34, EL 0.08, PW 0.26.

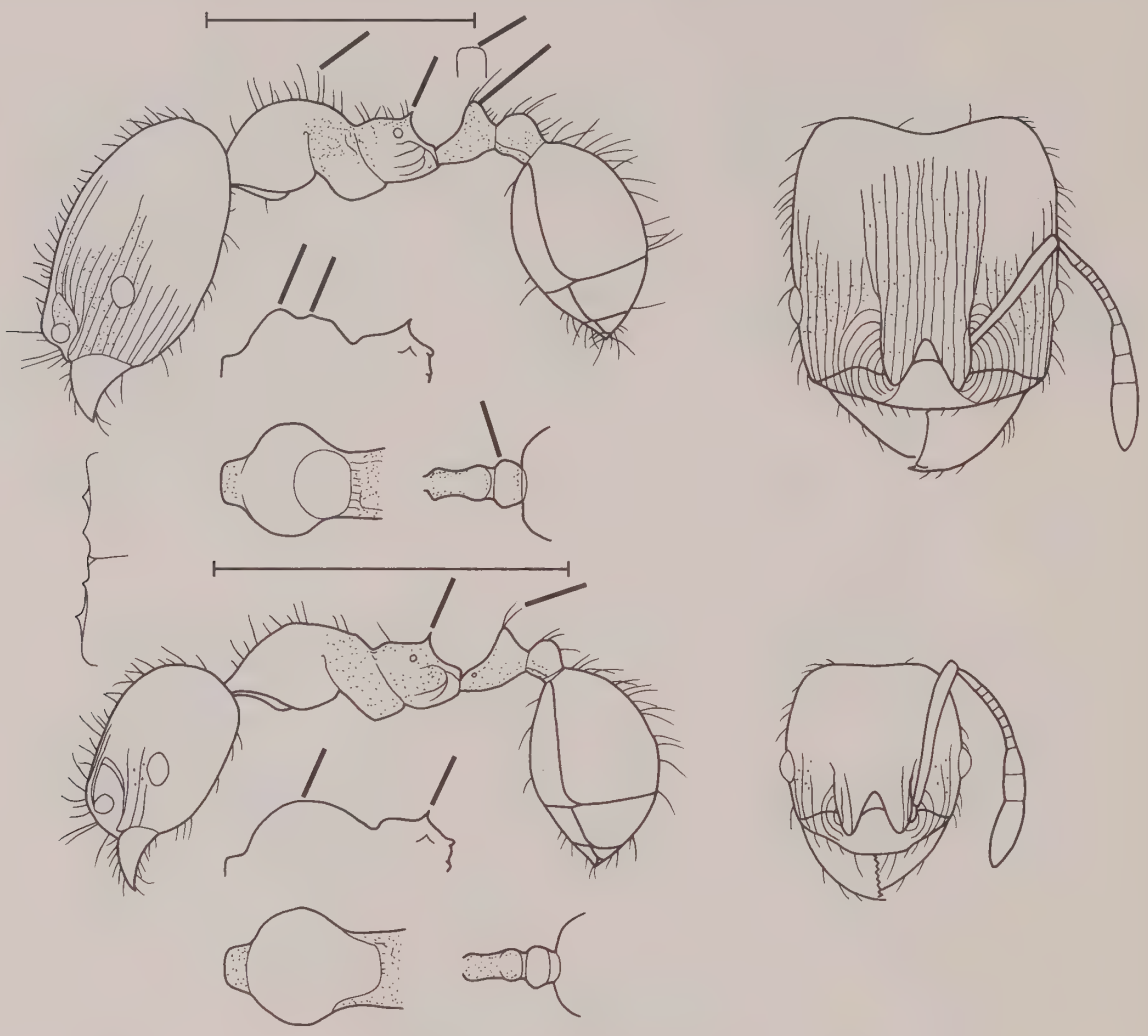
COLOR Major and minor: concolorous medium yellow.

RANGE Costa Rica.

BIOLOGY *P. longinoi* inhabits wet forest, nesting in internodes of *Cecropia insignis* saplings (J. T. Longino).

Compare with *chalca, delicata, ulothrix*

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: Caraguatatuba Reserve, São Paulo state, 40–80 m (William L. and Doris E. Brown). Scale bars = 1 mm.



Pheidole lucaris **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *lucaris,* from a grove, referring to the type locality.

DIAGNOSIS A medium sized, concolorous brown member of the *flavens* group characterized in the **major** by a somewhat flattened head in side view; relatively long, abundant, erect hairs on the mesosoma, waist, and gaster; short, equilateral propodeal spine in side view; longitudinal carinulae (but no rugoreticulum) covering the anterior dorsal half of the head, with middle section of clypeus smooth; postpetiolar node seen from above trapezoidal; and mesosoma mostly smooth and shiny.

Similar in some but not all of these traits to *chalca, delicata,* and *ulothrix,* and differing in others, as well as in additional details of body form, sculpturing, pilosity, and color, as variously indicated.

MEASUREMENTS (mm) Holotype major: HW 0.82, HL 0.92, SL 0.54, EL 0.14, PW 0.44.

Paratype minor: HW 0.44, HL 0.50, SL 0.40, EL 0.08, PW 0.28.

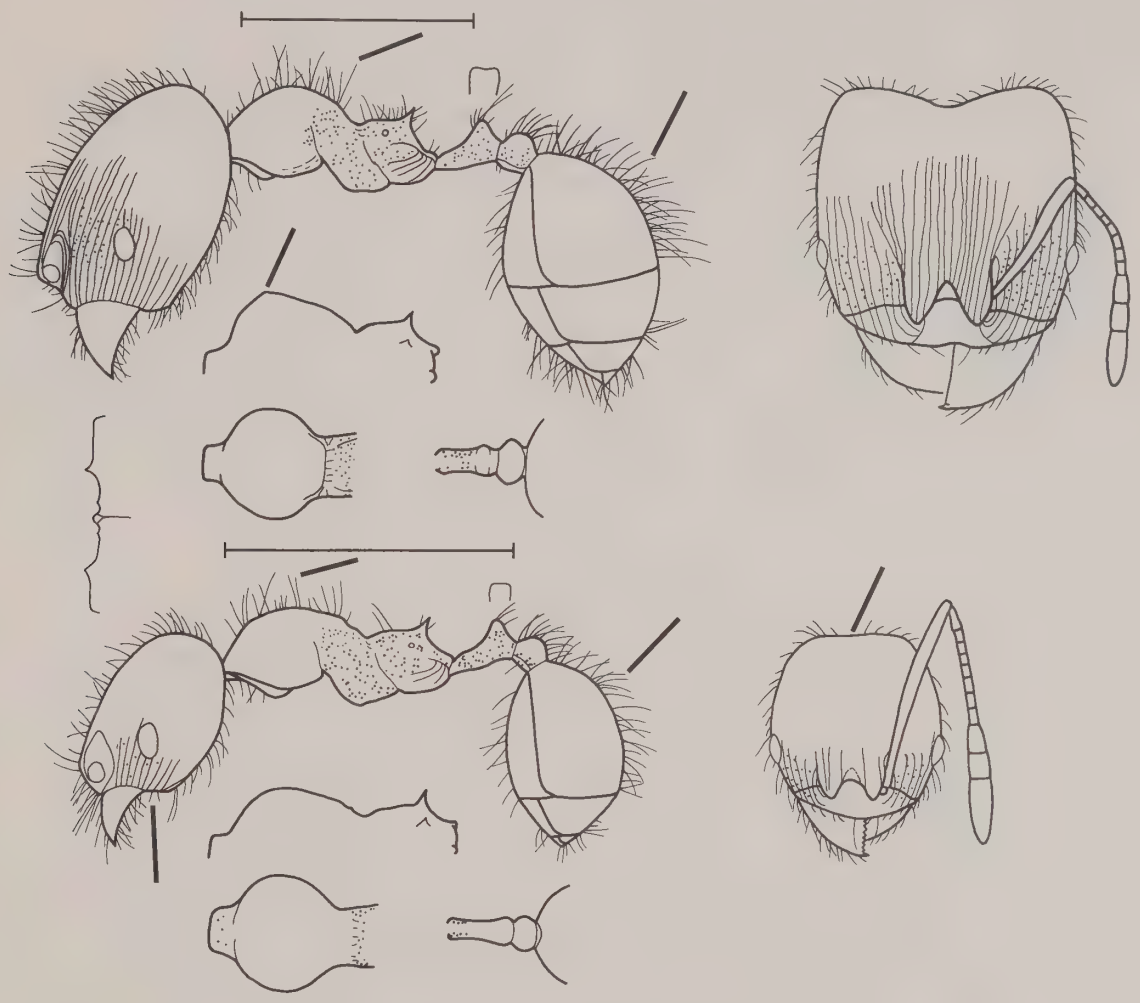
COLOR Major: body dark brown, appendages medium brown.

Minor: body medium brown, tarsi yellow, and remainder of appendages light brown.

RANGE Known only from the type locality.

BIOLOGY The type colony was collected in Atlantic lowland rainforest.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: 4 km south of San Vito, Puntarenas, 8°47′N 82°58′W, 1200 m (John T. Longino). Scale bars = 1 mm.



Pheidole lustrata **new species**

TYPES INBio.

ETYMOLOGY L *lustrata,* purified, referring to the mostly dark, shiny body.

DIAGNOSIS A distinctive medium-sized member of the *flavens* group with long, dense pilosity and dark brown body contrasting with yellow tarsi, in both castes. Similar to *albipes, alticola, browni, ebenina, euryscopa, hedlundorum, monteverdensis, palenquensis,* and *servilia,* differing as follows.

Major: eyes set well forward on head; humerus in dorsal-oblique view subangulate; extensive foveolation of mesopleuron and propodeum.

Minor: occiput in full-face view narrow and eyes placed more forward.

MEASUREMENTS (mm) Holotype major: HW 1.00, HL 1.04, SL 0.64, EL 0.14, PW 0.50.
Paratype minor: HW 0.54, HL 0.56, SL 0.62, EL 0.12, PW 0.34.

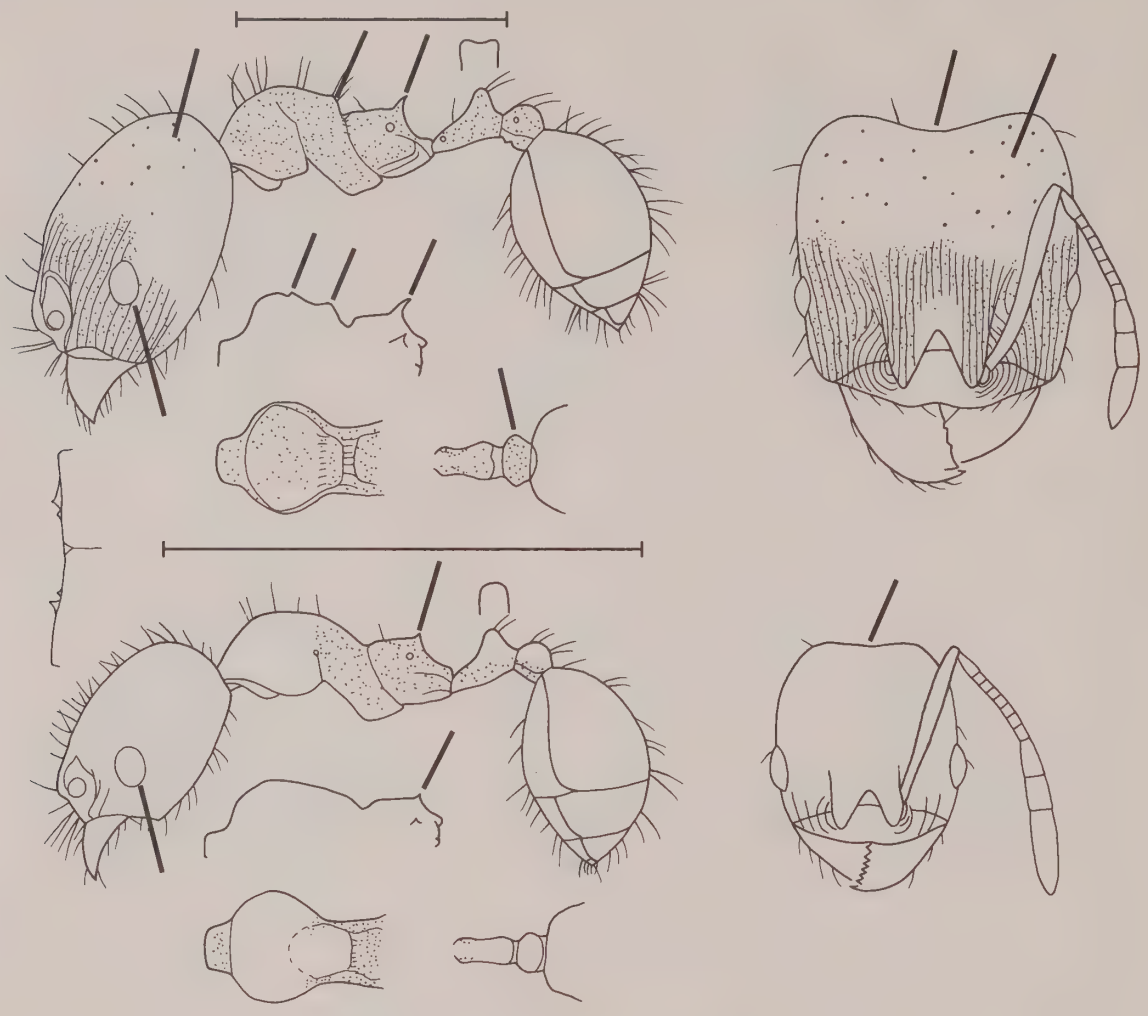
COLOR Major and minor: body dark brown, tarsi dark yellow, other appendages light brown.

RANGE Southern highlands of Costa Rica (J. T. Longino 1997).

BIOLOGY Occurs in leaf litter of mature wet montane forest (Longino 1997).

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: 24 km south of Cintalapa, Chiapas (William P. MacKay). Scale bars = 1 mm.



Pheidole mackayi **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the collector and myrmecologist William P. MacKay.

DIAGNOSIS Similar in various traits to *cerina, hizemops, micon, tachirana,* and *tenebra,* differing as follows.

Major: dark brown; in side view, promesonotal profile almost straight until it drops off posteriorly in a nearly vertical face to the metanotum; pronotum in dorsal-oblique view bilobous, and mesonotal convexity subangulate; eyes relatively large; propodeal spines curve backward; postpetiole from above diamond-shaped; posterior half of dorsal head surface smooth with widely scattered foveae.

Minor: eye very large, almost circular, set well forward on head; propodeal spines reduced to denticles; occiput narrowed, its margin concave, lacking nuchal collar.

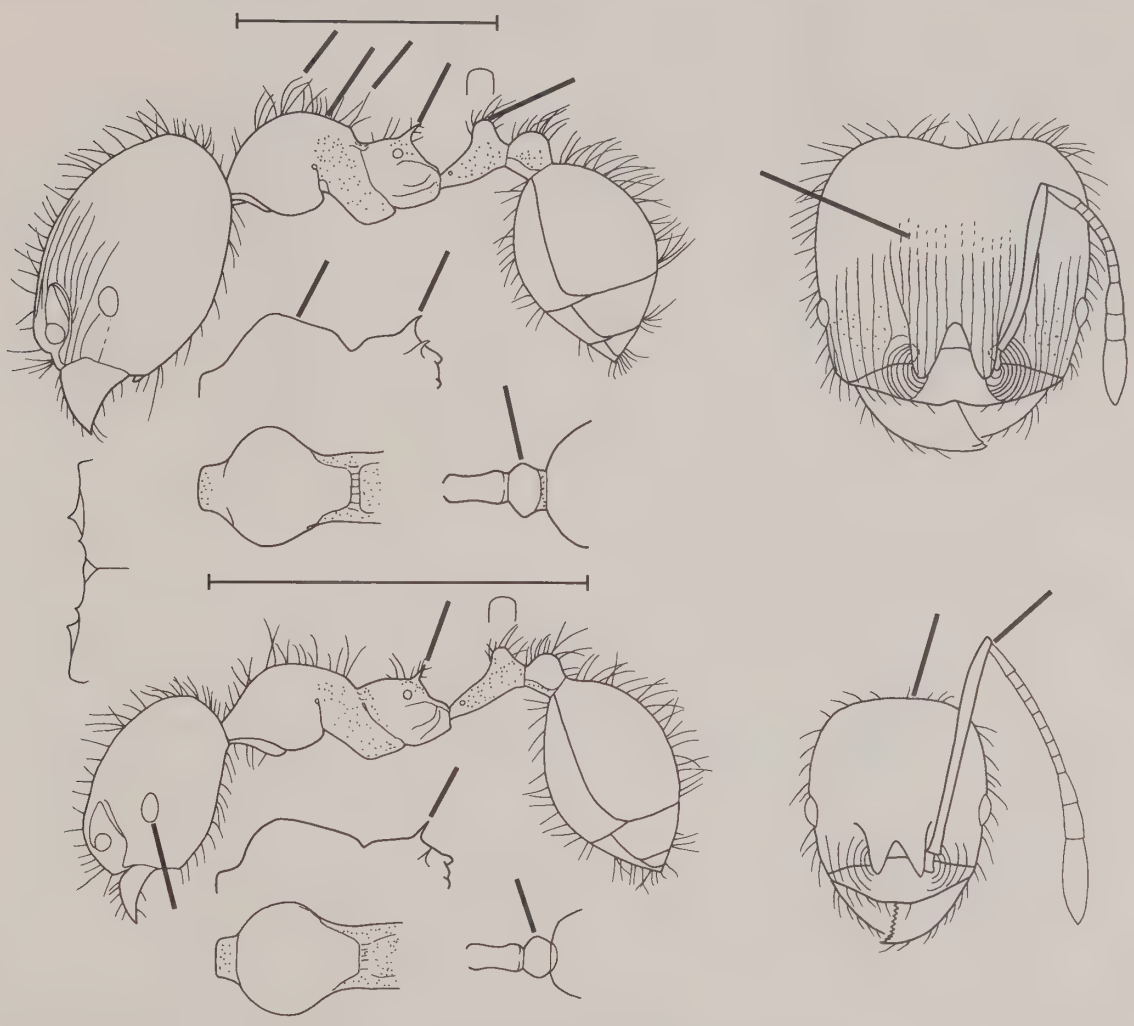
MEASUREMENTS (mm) Holotype major: HW 0.84, HL 0.86, SL 0.52, EL 0.12, PW 0.44.
Paratype minor: HW 0.40, HL 0.44, SL 0.36, EL 0.08, PW 0.24.

COLOR Major: body dark, almost blackish brown; appendages light brown.
Minor: body and antennae medium brown, legs yellow.

RANGE Known only from the type locality.

BIOLOGY The type colony was collected at a bait in a cut and burned-over forest area.

FIGURE Upper: holotype, major. Lower: paratype, minor. PANAMA: Nusagandi, San Blas (Leeanne E. Tennant-Alonso). Scale bars = 1 mm.

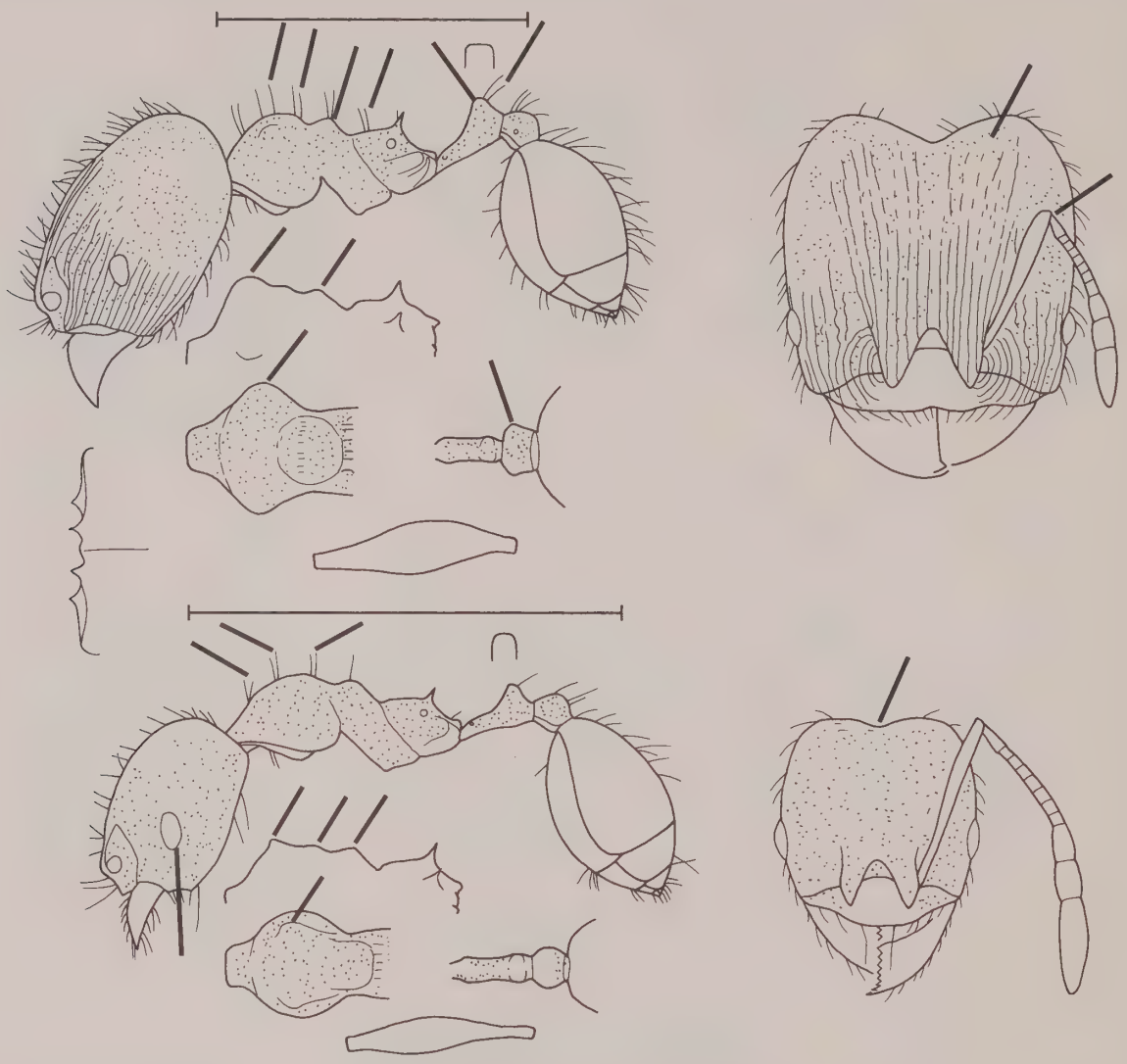


Pheidole mallota **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *mallota,* woolly, referring to dense, curving pilosity of body.
DIAGNOSIS Similar in various traits to *amabilis, arhuaca, citrina, crinita, delicata, hedlundorum, laselva, melastomae, nitidicollis, similgena, terresi,* and *tillandsiarum,* differing as follows.
Major: yellow; head as broad as long; antennal scapes long, their tips touching sides of head much more than halfway from eye to occipital corner; propodeal spines moderately long, directed backward, and curved; pilosity long, and many of the hairs curved and tangled; promesonotal profile flat; apex of petiolar node in side view broad and rounded; postpetiole from above elliptical, with angulate sides; carinulae cover only anterior half of head dorsum; most of body smooth and shiny.
Minor: eye narrow; occiput broad, convex; antennal scapes exceed occipital margins by a third their own length; propodeal spines very thin, needle-like.
MEASUREMENTS (mm) Holotype major: HW 0.90, HL 0.90, SL 0.58, EL 0.10, PW 0.42.
Paratype minor: HW 0.48, HL 0.54, SL 0.60, EL 0.06, PW 0.30.
COLOR Major: concolorous medium yellow, with a dark yellow spot on vertex.
Minor: concolorous dark yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *meinerti, tambopatae*

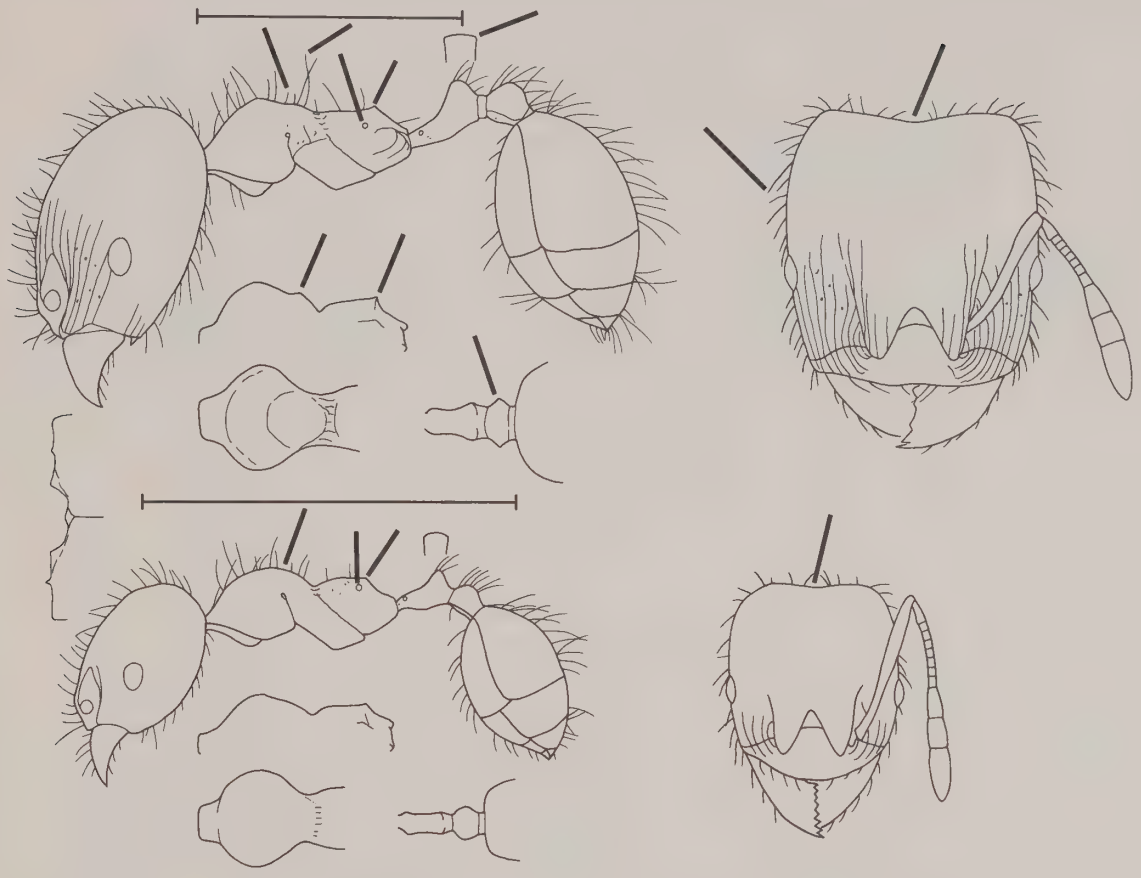
FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios (Stefan Cover and John E. Tobin). Scale bars = 1 mm.



Pheidole meinertopsis **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *meinertopsis,* resembling *(Pheidole) meinerti.*
DIAGNOSIS Resembling in some traits *meinerti* and *tambopatae,* differing as follows.
Major: reddish yellow; mesonotal convexity well developed; in dorsal-oblique view, dorsal pronotal profile bilobate, including a prominent lobose humerus; dorsal mesosomal pilosity sparse, consisting of a row of well-spaced pairs of setae; petiolar node tapers to a blunt point at apex; postpetiole from above trapezoidal; carinulae originating on frontal lobes spread outward slightly from the midline and extend to but not across the occiput.
Minor: pilosity sparse, on promesonotal profile consisting of evenly spaced pairs of setae; in dorsal-oblique view, pronotal profile bilobate; the humerus and mesonotal convexity angulate; eye set well forward on head; occiput broad and strongly concave.
MEASUREMENTS (mm) Holotype major: HW 0.88, HL 0.92, SL 0.46, EL 0.12, PW 0.42.
Paratype minor: HW 0.44, HL 0.46, SL 0.42, EL 0.06, PW 0.26.
COLOR Major: body and mandibles medium reddish yellow, other appendages clear medium yellow.
Minor: medium reddish yellow except for gaster and appendages, which are plain medium yellow.
RANGE Known only from the type locality.
BIOLOGY The type colony was found on the ground in terra firme forest, nesting in a rotten stick on top of leaf litter.

FIGURE Upper: holotype, major. Lower: paratype, minor. PANAMA: Estácion Nusagandi, Comarca de Kuna Yala, 350 m (Leeanne Tennant-Alonso). Scale bars = 1 mm.

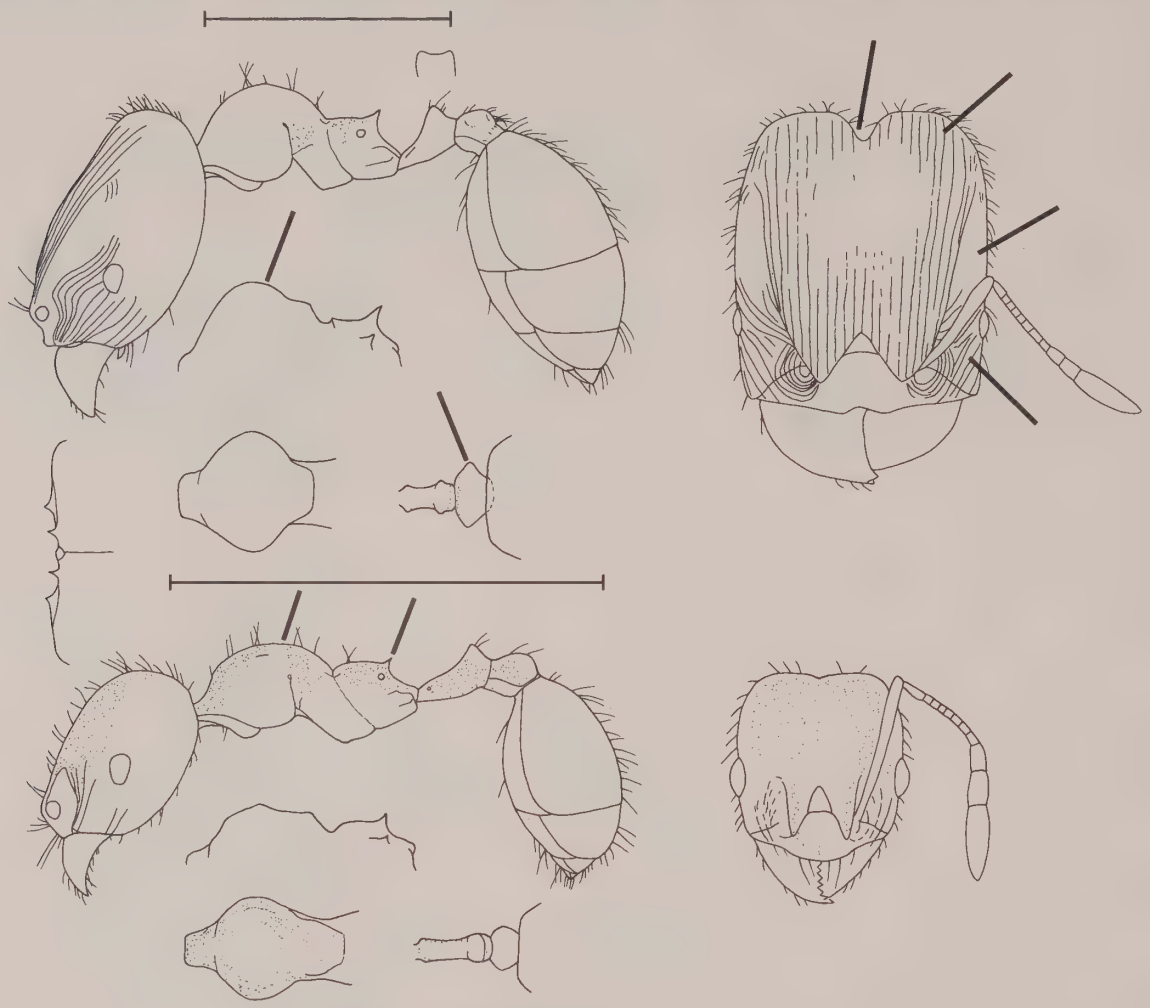


Pheidole melastomae **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *melastomae,* referring to the preferred melastome nesting site.
DIAGNOSIS A medium-sized, yellow member of the *flavens* group characterized by a nearly complete absence in **major** and **minor** of sculpturing anywhere behind the anterior half of the head, the reduction of the propodeal spine to an obtuse angle, the very small size of the propodeal spiracle, shallow occipital concavity in full-face view, and abundant long pilosity. The **major** is further distinguished by its overall flattened mesosomal dorsal profile and laterally angulate postpetiole.
Similar species: *amabilis, boliviana, mixteca, scitula, terresi,* and *tysoni*.
MEASUREMENTS (mm) Holotype major: HW 0.80, HL 0.84, SL 0.42, EL 0.10, PW 0.42.
Paratype minor: HW 0.44, HL 0.46, SL 0.42, EL 0.06, PW 0.24.
COLOR Major: body mostly clear medium yellow, with dorsum of head and mandibles brownish yellow.
Minor: concolorous light to medium yellow.
RANGE Known from the type locality in Panama and from Colombia (near San José, Chocó, localities in Valle) and Ecuador (Endesa, Pichincha).
BIOLOGY Hilly rainforest, nesting in myrmecophytic melastomes (Leeanne Tennant-Alonso in Panama and Colombia). Winged males were present in a nest in Colombia in early June and in Panama in early July.

Compare with *casta, guajirana, tysoni*

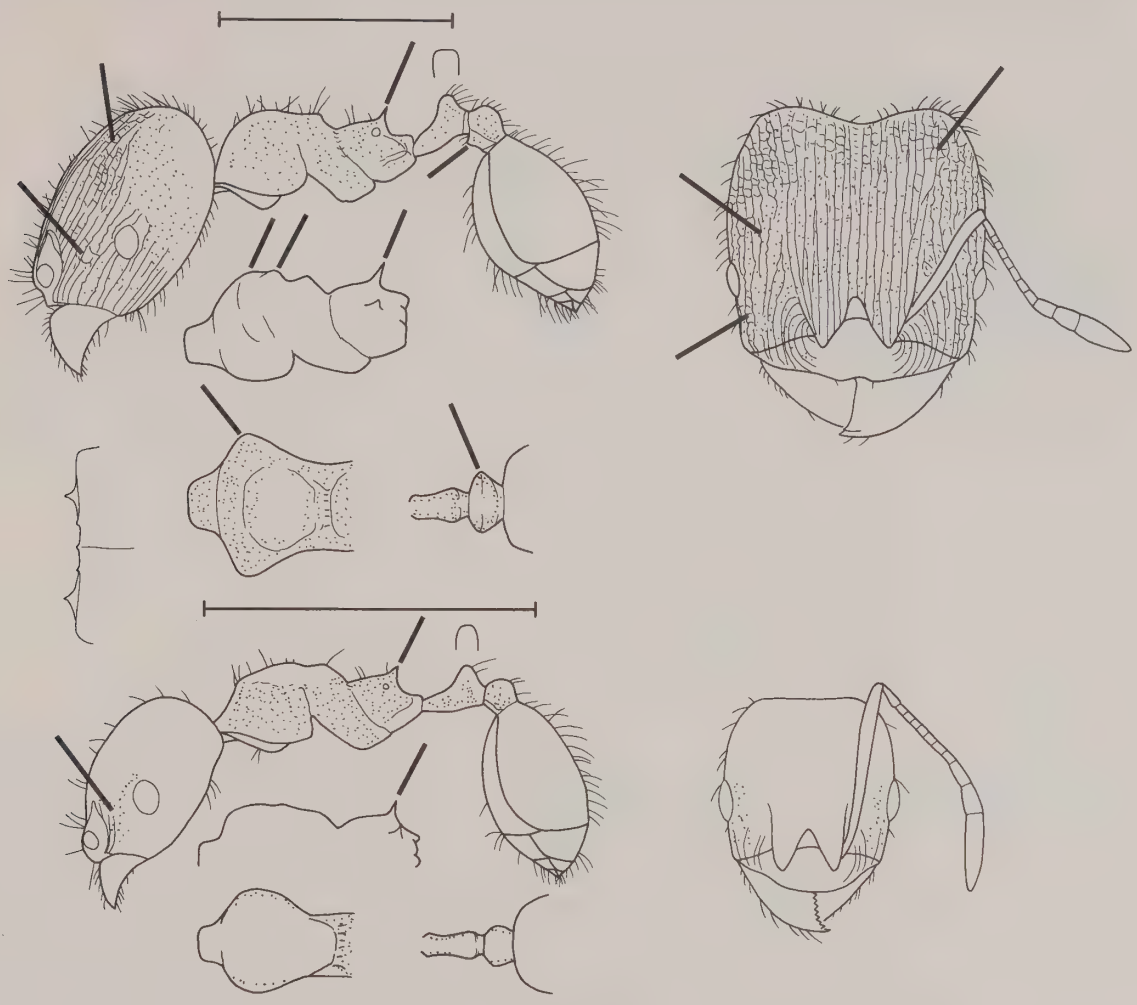
FIGURE Upper: holotype, major. Lower: paratype, minor. TEXAS: La Feria, Cameron Co. (W. S. Creighton). Scale bars = 1 mm.



Pheidole mera **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *mera,* pure, unadulterated, referring to the color.
DIAGNOSIS A medium-sized yellow species whose **major** has an elongate head, shallow scrobes, deep occipital cleft, semicircular promesonotal profile, and cornulate postpetiole. Similar to *casta,* but the *mera* major differs in its carinulate and deeply cleaved occiput, oblique orientation of the carinulae mesad to the eyes, and more bulbous promesonotal profile.
MEASUREMENTS (mm) Holotype major: HW 0.80, HL 0.94, SL 0.42, EL 0.14, PW 0.50.
Paratype minor: HW 0.44, HL 0.46, SL 0.38, EL 0.08, PW 0.26.
COLOR Major and minor: concolorous clear yellow.
RANGE Central and southern Texas (Cameron, Hidalgo, and Travis counties).
BIOLOGY Unknown.

FIGURE Upper: major. Lower: minor. FLORIDA: Archbold Station, near Sebring, Highlands Co. [Type locality: St. George (Cape or Island), Florida.] Scale bars = 1 mm.



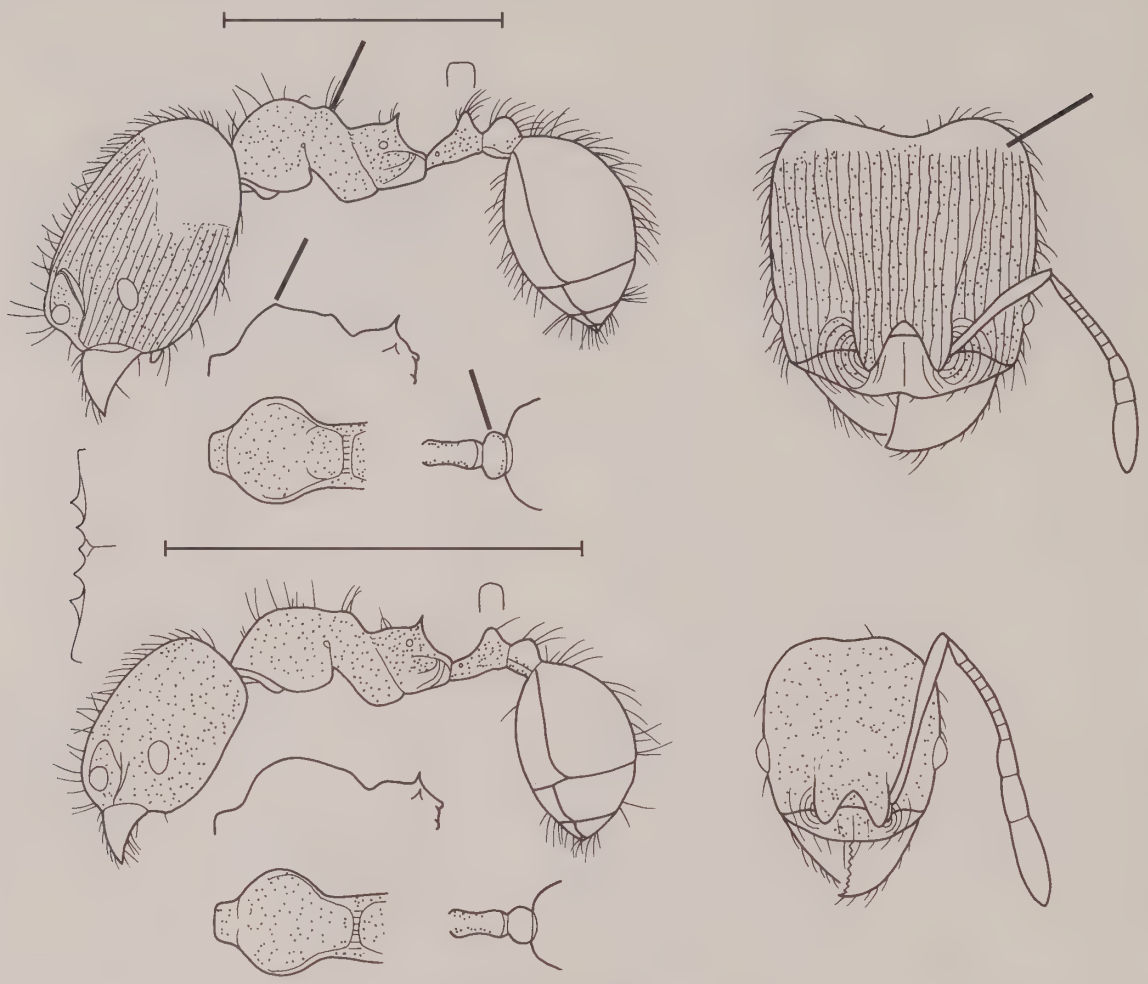
Pheidole metallescens Emery

Pheidole metallescens Emery 1895d: 294. Syn.: *Pheidole metallescens* subsp. *splendidula* Wheeler 1908h: 474, n. syn.

TYPES Mus. Civ. Stor. Nat. Genova.
ETYMOLOGY L *metallescens,* metallic, alluding to the gun-metal blue reflections from the body of the minor.
DIAGNOSIS A distinctive species, similar in some traits to *ceibana, harrisonfordi,* and *lignicola,* distinguished as follows.
Major: reddish brown; occiput rugoreticulate, with the reticulum extending partway anteriorly down the side of the head to near the eye, and another, small patch of rugoreticulum occurs between the eye and antennal fossa on each side; humerus prominent, subangulate from above and lobate in dorsal-oblique view; propodeal spine long and thin; postpetiole wide and elliptical from above, and with subangulate anterior ventral margin.
Minor: body blackish with bluish reflections; often most of mesosoma foveolate and opaque.
Minors of some series have entirely foveate heads and may represent a distinct species.
MEASUREMENTS (mm) Major (Archbold Station, Florida): HW 0.84, HL 0.94, SL 0.42, EL 0.12, PW 0.44.
Minor (Archbold Station): HW 0.42, HL 0.46, SL 0.40, EL 0.10, PW 0.26.
COLOR Major: bicolored, with head and appendages light reddish brown, and rest of body medium to dark brown.
Minor: body concolorous blackish brown, with metallic bluish reflections; central parts of femora and tibiae medium brown; distal and proximal portions brownish yellow.
RANGE From central Florida through the Gulf States to Oklahoma and southern Texas.
BIOLOGY Naves (1985) reports *metallescens* as common in Florida, preferring to nest in the shade of trees. Nests are in the soil, surrounded by small craters of excavated earth, and comprising small chambers connected by a central vertical gallery to a depth of up to 40 cm. Each colony has a single queen. The minor workers, often accompanied by majors, collect small grass seeds and scavenge for dead arthropods. In Texas, Stefan Cover found the species in similar habitats, nesting variously in the soil and in rotting logs.

Compare with *breviseta, bruchella, hizemops*

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: San Pedro de la Sierra, Magdalena, Colombia, 1300 m (Charles Kugler). Scale bars = 1 mm.



Pheidole micon **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Micon, a painter and sculptor of ancient Athens.

DIAGNOSIS A medium-sized member of the *flavens* group; most immediately recognizable by the striking bicolorous condition of both castes (see below). Most similar in the remainder of its anatomy to *breviseta, bruchella,* and *hizemops,* differing in details of sculpturing and form of the mesosoma, petiole, and postpetiole, as illustrated.

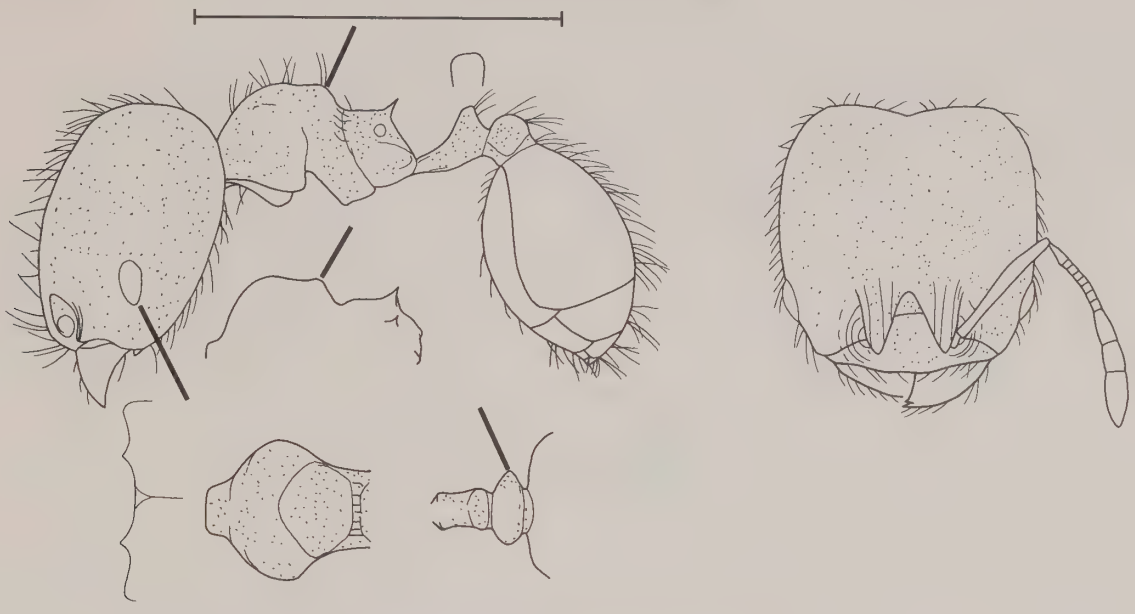
MEASUREMENTS (mm) Holotype major: HW 0.94, HL 0.96, SL 0.50, EL 0.14, PW 0.42.
Paratype minor: HW 0.44, HL 0.52, SL 0.42, EL 0.06, PW 0.28.

COLOR Major: bicolorous, body dark brown, appendages dark yellow.
Minor: bicolorous, postpetiole and gaster medium to brownish yellow, rest of body medium brown, appendages medium yellow.

RANGE Known only from the type series.

BIOLOGY Found in a rotting log in a coffee plantation *(cafetal)*.

FIGURE Unique holotype, major. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios (Stefan Cover and John E. Tobin). Minor unknown. Scale bar = 1 mm.

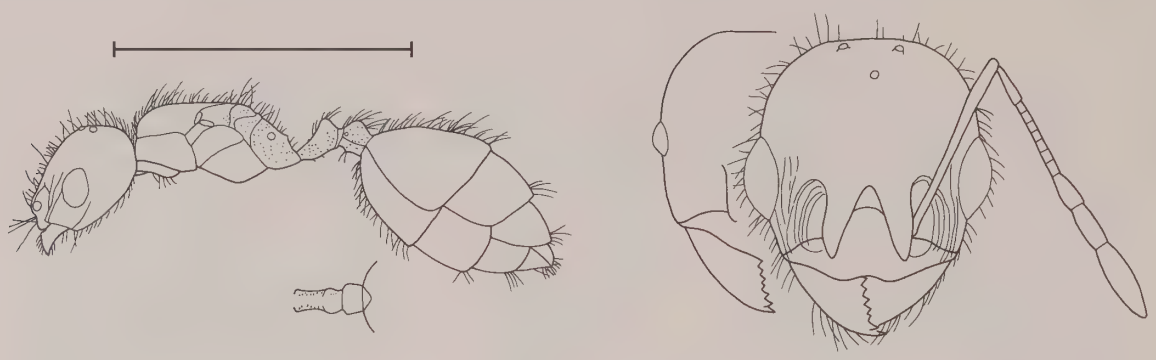


Pheidole micridris **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *micridris,* small and knowing one.
DIAGNOSIS Unique, distinguished in the **major** by the very small size; circular head shape in full-face view; eyes set far forward in the head; raised promesonotum that drops through a long, steep face to the metanotum; conate postpetiole; restriction of carinulae to the frontal lobes and antennal fossae; and completely foveolate head and mesosoma.
Minor: unknown.
MEASUREMENTS (mm) Holotype major: HW 0.64, HL 0.64, SL 0.34, EL 0.12, PW 0.32.
COLOR Major: dark yellow, with gaster a shade darker of brownish yellow.
RANGE Known only from the type locality.
BIOLOGY The type specimen was collected from a "red rotten" log on the floor of terra firme forest.

Compare with queen of *minutula*

FIGURE Lectotype, queen. GUYANA: Kartabo.
Outline of frontal view of head of *minutula* worker shown to left of that of the queen. Scale bar = 1 mm.

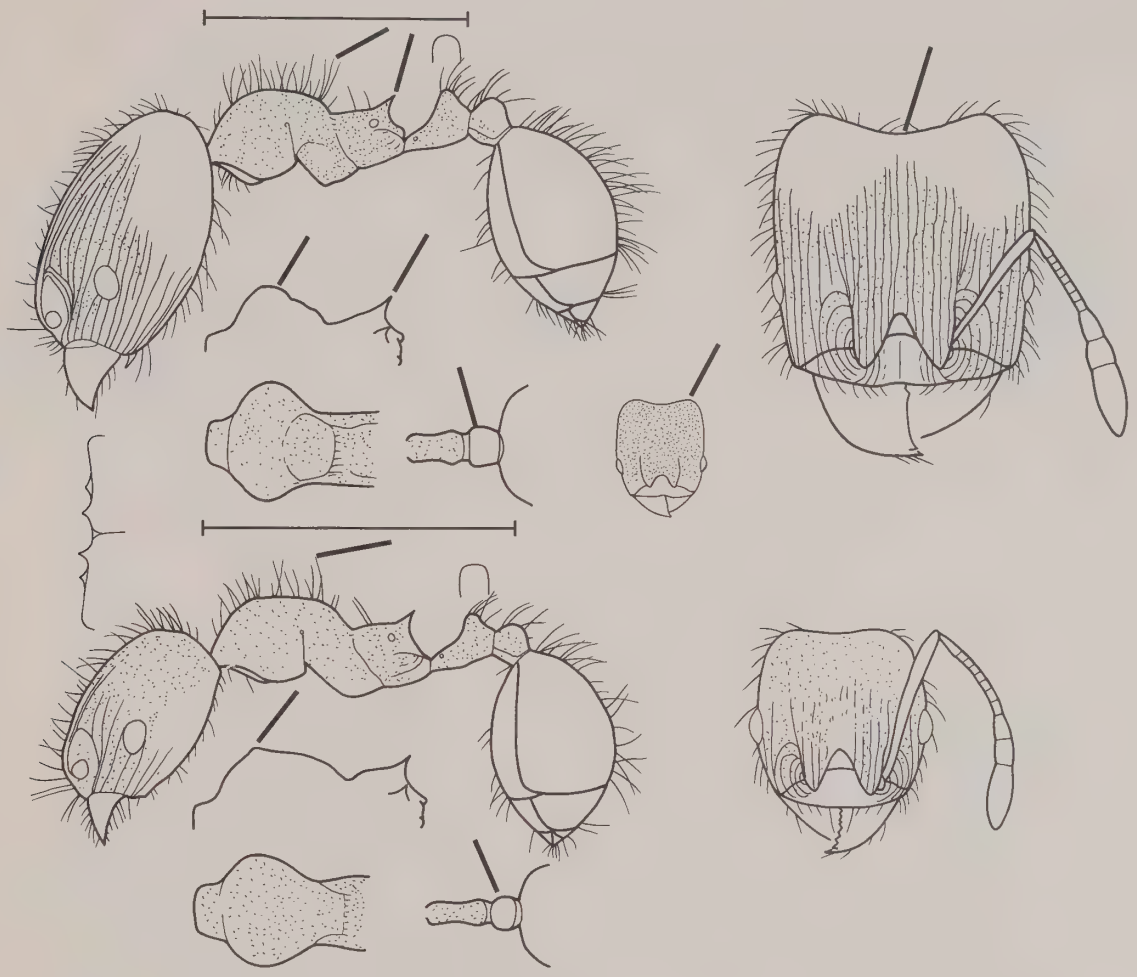


Pheidole microgyna Wheeler

Pheidole microgyna Wheeler 1928b: 186. Further definition of status in Wilson 1984b: 323.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *microgyna,* small female.
DIAGNOSIS A member of the *flavens* group similar to *minutula* but the queen much smaller, close in size to the worker caste of *minutula*. Body form as illustrated above.
MEASUREMENTS (mm) Lectotype queen: HW 0.46, HL 0.48, SL 0.40, EL 0.20, PW 0.36.
COLOR Concolorous light reddish brown, appendages yellowish brown.
RANGE Known only from the type locality.
BIOLOGY *P. microgyna* appears to be a social parasite of *Pheidole minutula*. The latter species is abundant in the Amazonian and Guianan rainforests of South America, where it nests in the swollen leaf bases of the melastome understory shrub *Maieta guianensis*. In an earlier analysis (Wilson 1984b), I pointed out that *microgyna* may have its own workers, which are anatomically somewhat different from those of *minutula,* or workers identifiable as *minutula*. This circumstance suggests that *microgyna* is a temporary social parasite of *minutula* or some related free-living species. The small size of the *microgyna* queens also suggests such a life cycle. However, the status of this unusual form will not be solved until additional collections are made, preferably with field observations, allowing the taxonomy of the *minutula* complex to be more fully clarified.

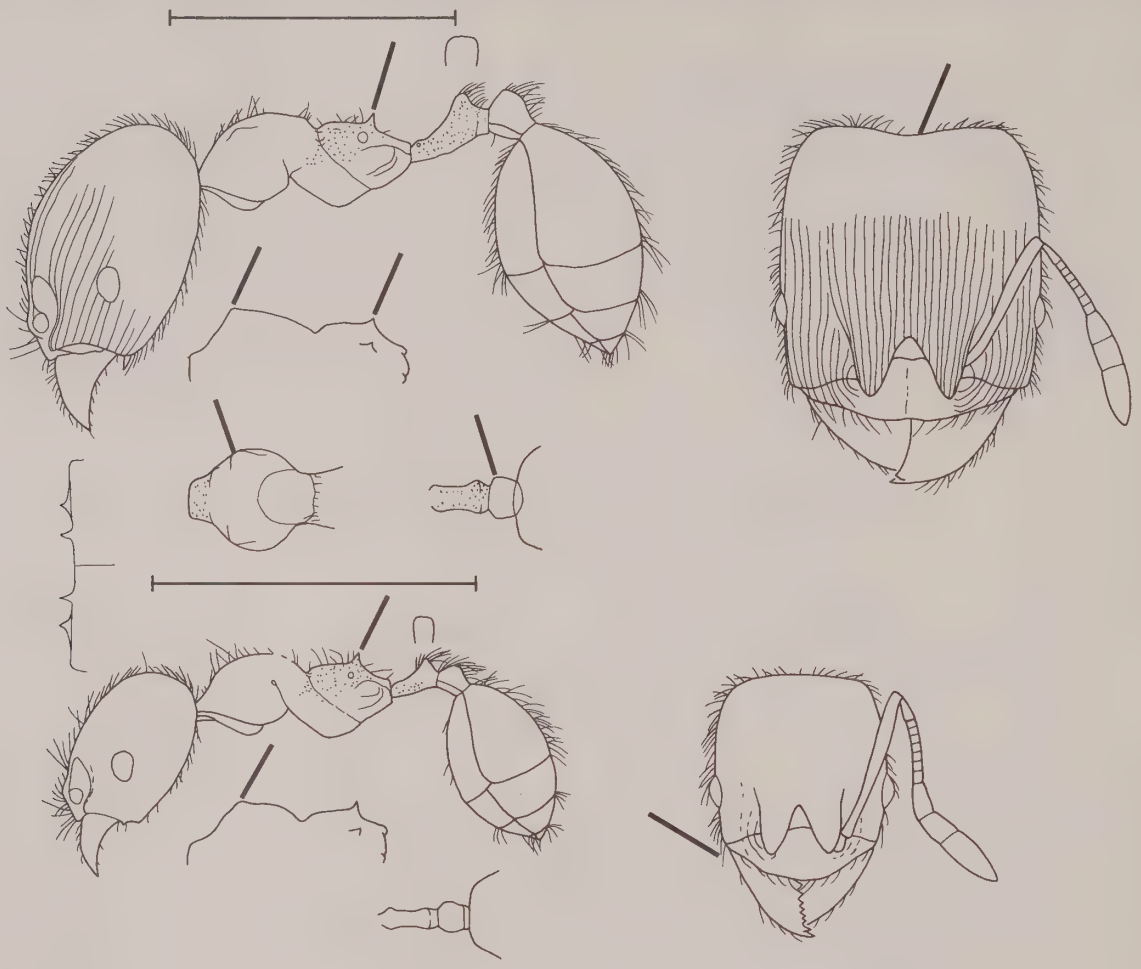
FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Minca, Magdalena, 610 m (Charles Kugler). Scale bars = 1 mm.



Pheidole mincana **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *mincana,* referring to the type locality.
DIAGNOSIS A small, medium to dark brown species, whose **major** has a bicolorous head, widely concave occipital margin in full-face view, and trapezoidal postpetiolar node. The **major** has a prominently lobose pronotal humerus in dorsal-oblique view, and the **minor** has a small oblique-angular protrusion on the humerus in the same view. Both castes have a long, robust, posteriorly directed propodeal spine and dense, long, mostly erect pilosity over most of the body.
Similar to *tambopatae* but differing to some extent in all the traits just described.
See also the less similar *arhuaca, caulicola, chalca, chalcoides, schmalzi,* and *tragica*.
MEASUREMENTS (mm) Holotype major: HW 0.80, HL 0.86, SL 0.44, EL 0.10, PW 0.42.
Paratype minor: HW 0.52, HL 0.54, SL 0.46, EL 0.08, PW 0.34.
COLOR Major: body medium brown; head bicolorous, with anterior fifth dark yellow and posterior four-fifths medium brown; appendages light brown.
Minor: body medium to dark brown; tarsi yellow; rest of appendages light brown.
RANGE Known only from the type series.
BIOLOGY Specimens were collected from a rotting log.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Amazonas (James Trail). Scale bars = 1 mm.

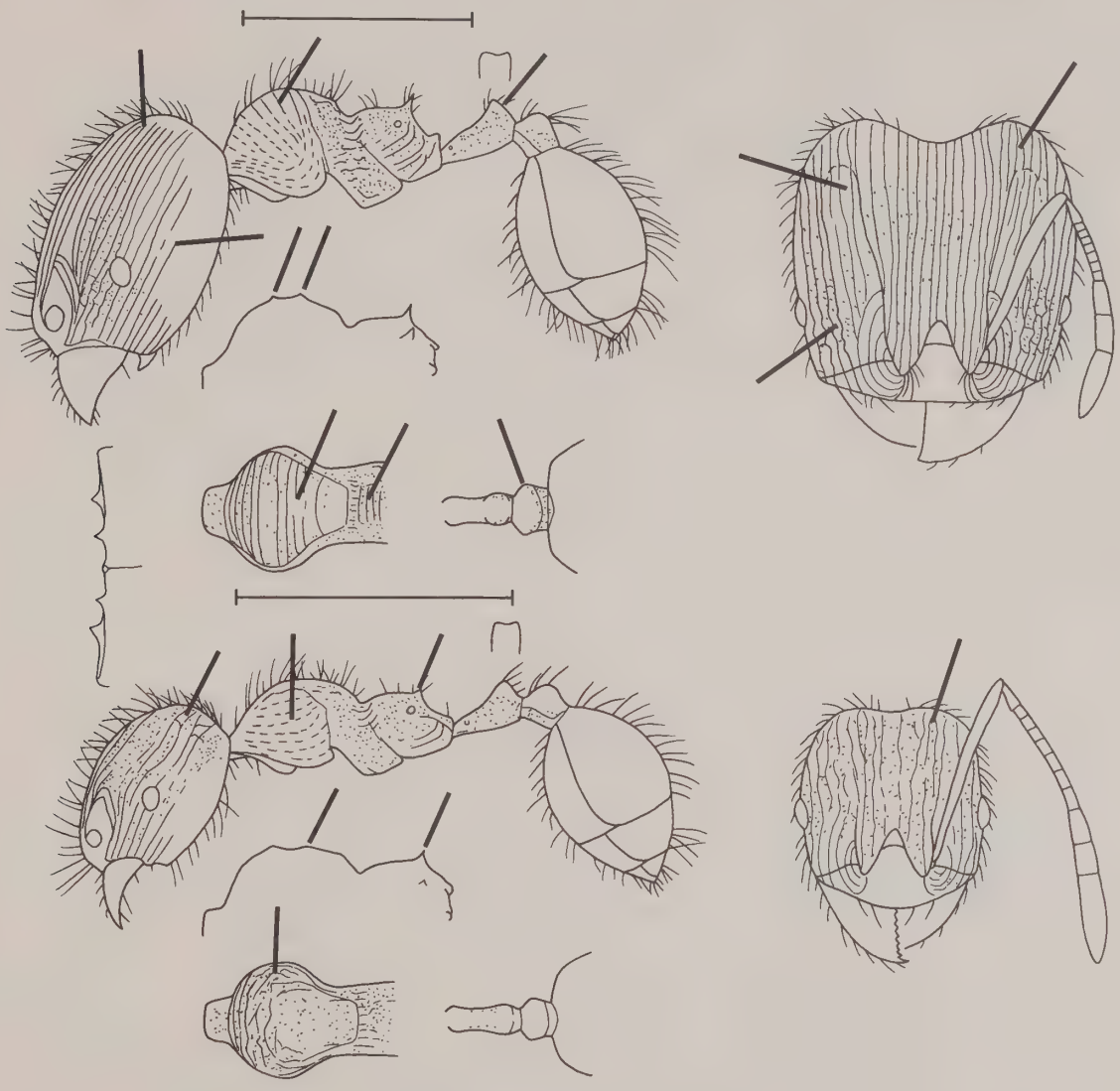


Pheidole minutula Mayr

Pheidole minutula Mayr 1878: 872. Syn.: *Pheidole minutula* r. *folicola* Forel 1904f: 681, n. syn. [Not seen: types of *Pheidole minutula* var. *personata* Santschi 1929d: 291.]

TYPES Naturhist. Mus. Wien.
ETYMOLOGY L *minutula,* very small.
DIAGNOSIS A very small, yellow species, found in the myrmecophyte *Maieta,* distinguished in the **major** by the relatively high, subangulate humerus seen in dorsal-oblique view, the extrusion of the humeral angles slightly beyond the lower part of the pronotum beneath when seen from above, and the parallel longitudinal carinulae covering the anterior half of the head capsule; and in **both castes** by the mostly smooth and shiny body surface.
Similar to *nitidicollis* and *tenerescens* but distinguished by its flatter promesonotal profile, much shallower occiput in full-face view, and absence of transverse carinulae on the anterior pronotal dorsum. See also the less similar *arhuaca, flavifrons,* and other species listed as close to *arhuaca*; and compare the queen to the small, possibly parasitic *microgyna*.
MEASUREMENTS (mm) Lectotype major: HW 0.76, HL 0.86, SL 0.42, EL 0.14, PW 0.40.
Paralectotype minor: HW 0.44, HL 0.50, SL 0.38, EL 0.06, PW 0.26.
COLOR Major: body concolorous yellow; gaster, antennae, and legs a shade lighter.
Minor: concolorous yellow.
RANGE Widespread from Panama and the Guianas to Amazonian Brazil, Peru, and Ecuador.
BIOLOGY Colonies were found at Belém by Joseph Bequaert and near Manaus by myself in the swollen leaf bases of the melastome understory shrub *Maieta guianensis*. The species was abundant where I collected it from the swollen leaf bases of *Maieta guianensis* (Wilson 1984b). I was able to keep colonies alive and growing in artificial nests away from the melastomes. *P. minutula* may be the host of another species, *P. microgyna,* but the status of this form is problematic (Wilson 1984b). Winged queens have been found in nests from July to September.

FIGURE Upper: holotype, major. Lower: paratype, minor. BOLIVIA: Serena de Huanchaca, Las Gamas, Parque Nacional Noel Kempff Mercado, Santa Cruz, 14°48′S 60°23′W, 700 m (Philip S. Ward). Scale bars = 1 mm.

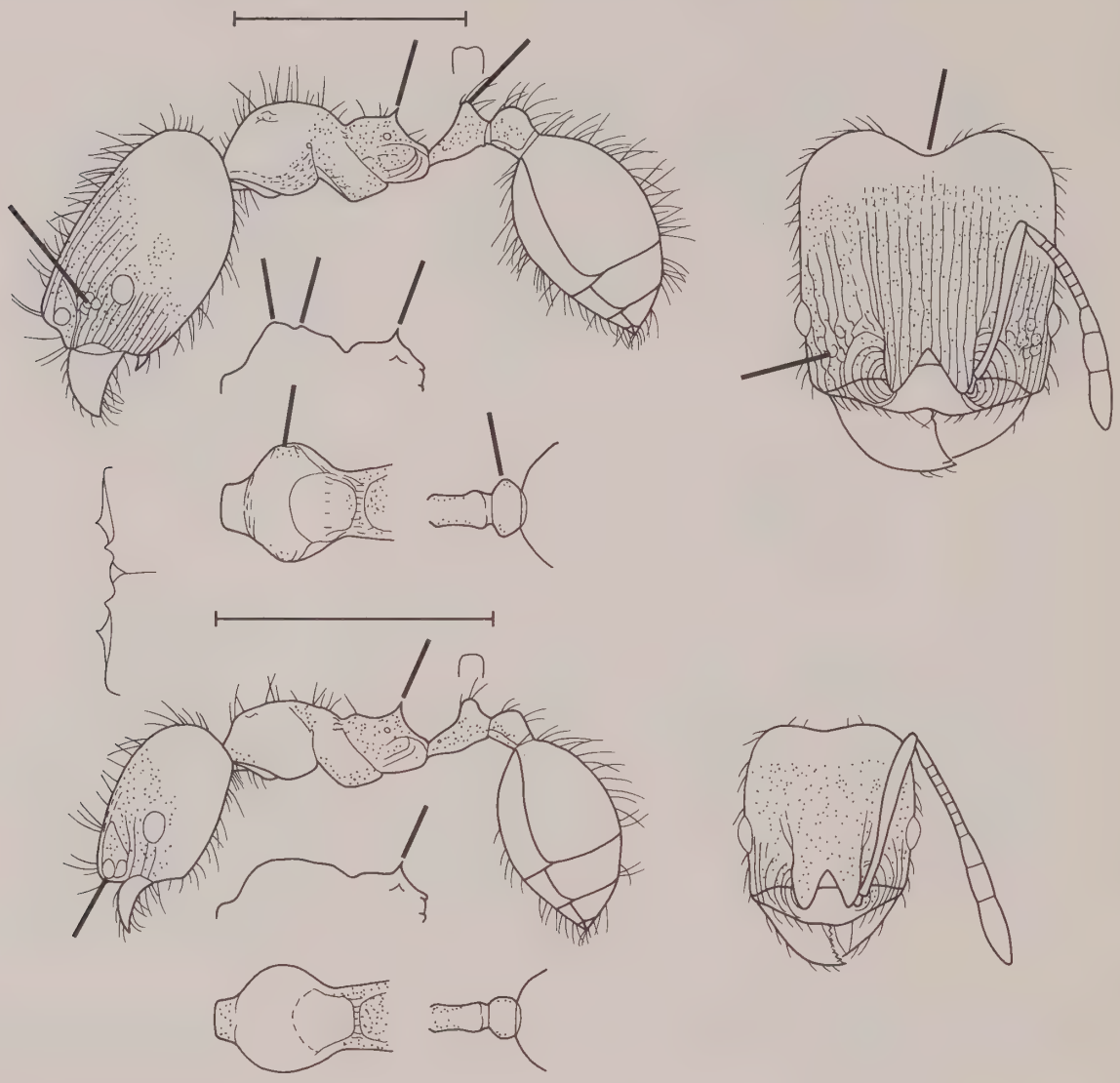


Pheidole mittermeieri **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after Russell A. Mittermeier, distinguished tropical biologist and conservationist.
DIAGNOSIS Similar in various traits to the species listed above, differing as follows.
Major: almost all of dorsum of head, most of the sides of head, and almost all the mesosoma covered by carinulae; carinulae on anterior pronotal dorsum curve down and then along the lower pronotal margin; faint antennal scrobes present; in dorsal-oblique view, two denticles present on pronotal profile; in side view, petiolar node tapers to a point; postpetiole from above elliptical.
Minor: most of dorsal and lateral surfaces of head, including occiput variously carinulate and rugulose; anterior third and dorsal margins of promesonotum rugulose to rugoreticulate; propodeal spines reduced to denticles.
MEASUREMENTS (mm) Holotype major: HW 1.14, HL 1.10, SL 0.70, EL 0.14, PW 0.52.
Paratype minor: HW 0.60, HL 0.66, SL 0.66, EL 0.08, PW 0.46.
COLOR Major: head, mesosoma, waist, and antennae light brown; gaster and legs dark yellow.
RANGE Known only from the type locality.
BIOLOGY The type series was collected in a savanna, from a termite mound. Winged queens were present in the nest 2 December.

Compare with *oaxacana, scabriventris, tragica*

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: 30 km south of Juchatengo, Oaxaca, 650 m (Stewart B. Peck). Scale bars = 1 mm.



Pheidole mixteca **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY After Mixtec, the Amerindian people of Oaxaca.

DIAGNOSIS Species similar in various traits to *oaxacana, scabriventris,* and *tragica,* and distinguished as follows.

Major: yellow; pronotum bilobed in dorsal-oblique view; propodeal spine short, nearly vertical in dorsal-oblique view; petiolar node narrow in side view; rugoreticulum present between eye and antennal fossa; postpetiolar node broad and acutely subangular; humerus bearing a small patch of rugulae.

Minor: frontal lobes bulging forward in side view; propodeal spine short and nearly erect.

MEASUREMENTS (mm) Holotype major: HW 0.90, HL 1.00, SL 0.58, EL 0.16, PW 0.44.

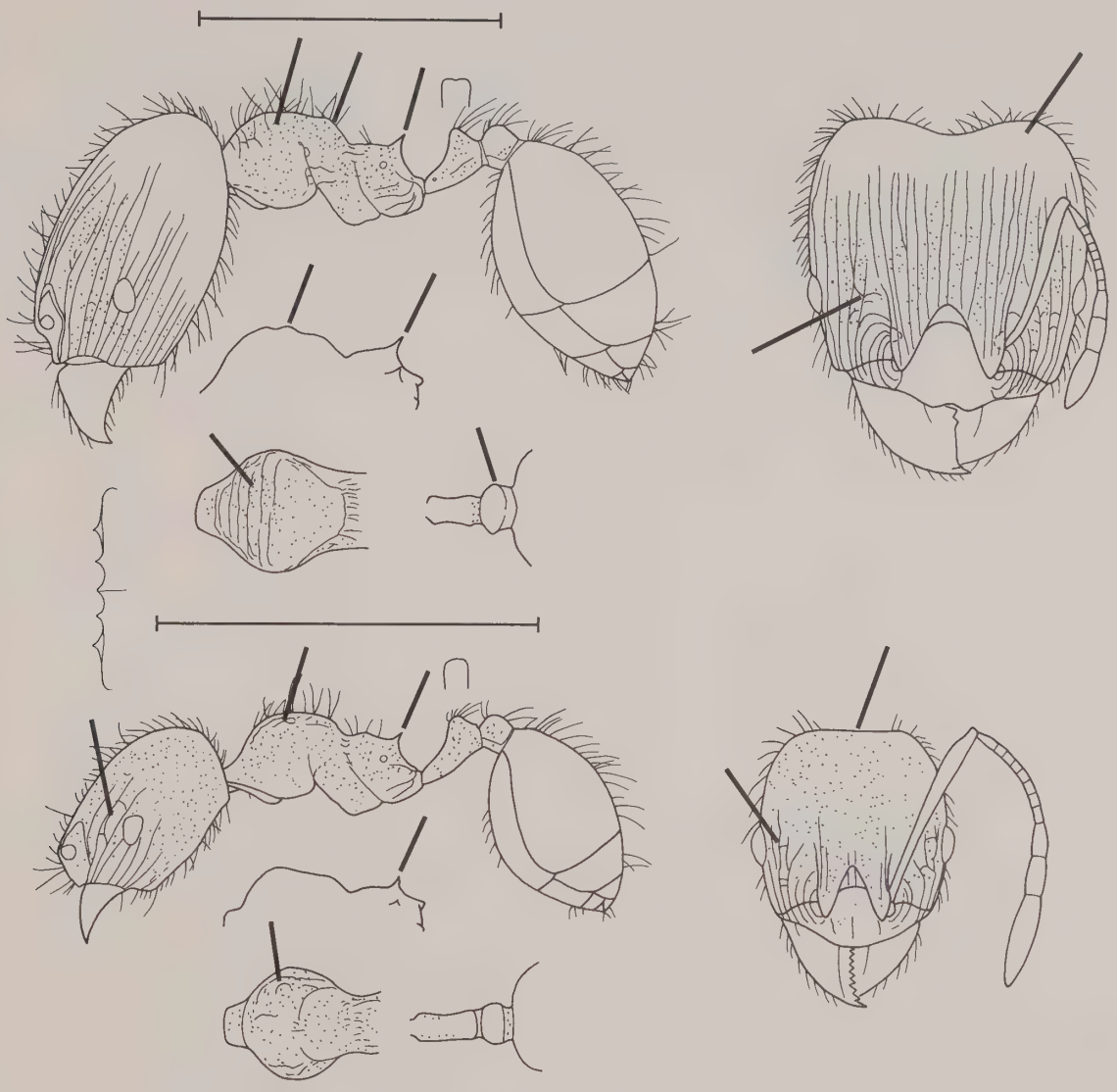
Paratype minor: HW 0.46, HL 0.56, SL 0.46, EL 0.08, PW 0.32.

COLOR Major: head and mandibles reddish yellow, gaster brownish yellow; other appendages medium yellow.

RANGE Known only from the type series.

BIOLOGY Collected in the leaf litter of oak woodland.

FIGURE Upper: syntype, major. Lower: syntype, minor. PUERTO RICO: Utuado. (Type locality: Culebra Island, West Indies.) Scale bars = 1 mm.



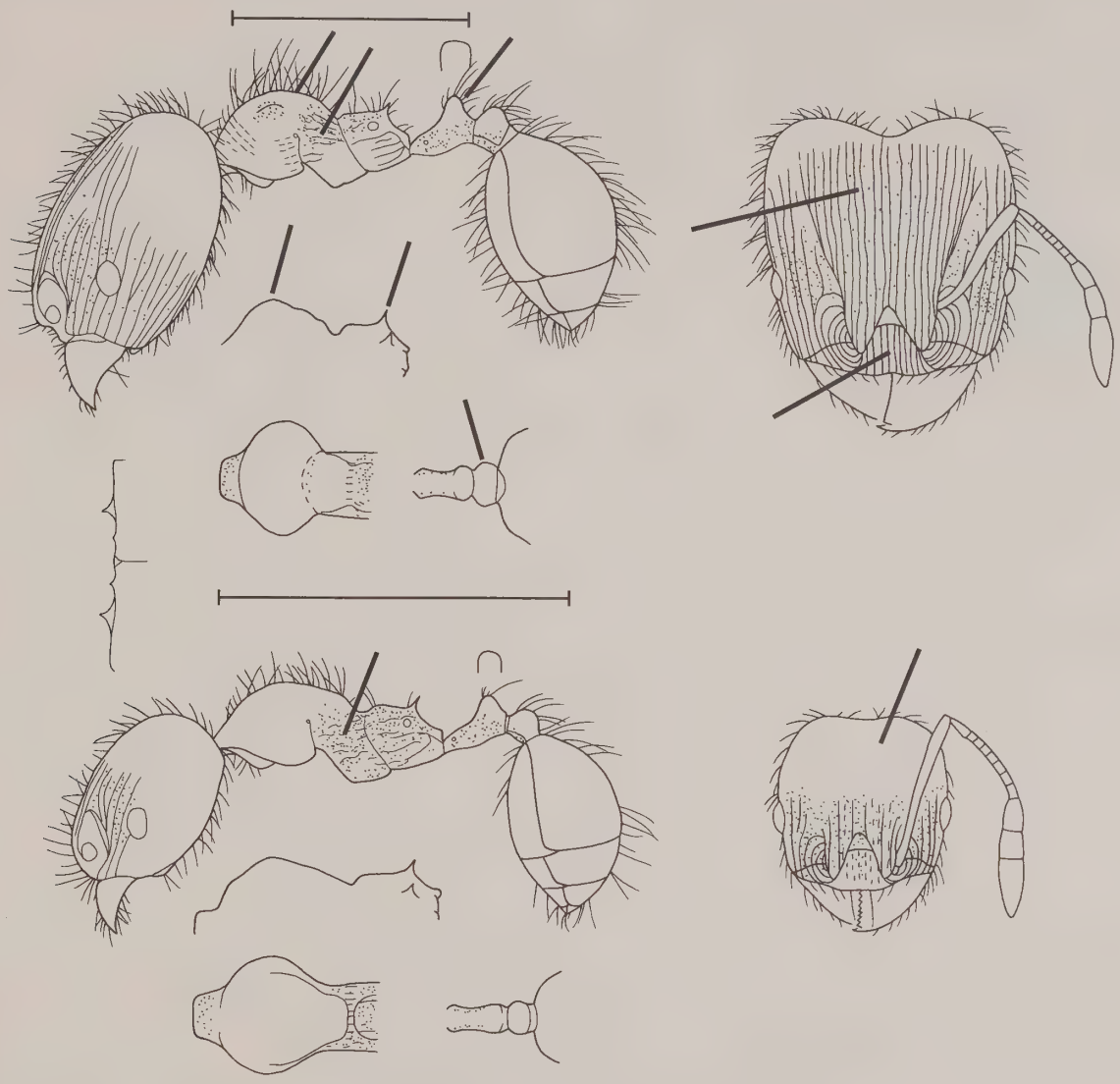
Pheidole moerens Wheeler

Pheidole moerens Wheeler 1908a: 136. Syn.: *Pheidole moerens* subsp. *creola* Wheeler and Mann 1914: 25, n. syn.; *Pheidole moerens* subsp. *dominicensis* Wheeler 1913e: 241, synonymy by Naves 1985: 65.

TYPES Amer. Mus. Nat. Hist.; Mus. Comp. Zool. Harvard.
ETYMOLOGY Unknown, possibly Gr Moira, goddess of destiny.
DIAGNOSIS Similar to *exigua, flavens, nitidicollis, nuculiceps, orbica, pholeops,* and *sculptior,* easily confused with the sympatric and abundant *flavens,* distinguished as follows.
Major: variably reddish brown; occiput smooth and shiny, and most of rest of head carinulate, with a small patch of rugoreticulum just behind the antennal fossa on each side; intercarinal spaces on head sparsely foveolate, subopaque to feebly shining; anterior half of pronotum carinulate; postpetiole from above elliptical.
Minor: medium to dark brown; small, loose rugoreticulum present mesad to each eye; rugulae extend posterior to eyes; all of head and mesosoma foveolate.
P. moerens is distinguished from *flavens* by the broader smooth space of the occiput and feebler intercarinular foveolation on the head of the major, and especially by the darker color and more extensive sculpturing of the minor.

MEASUREMENTS (mm) Syntype major: HW 0.84, HL 0.90, SL 0.46, EL 0.10, PW 0.40.
Syntype minor: HW 0.42, HL 0.48, SL 0.44, EL 0.06, PW 0.26.
COLOR Major: medium reddish brown, with vertex a shade darker.
Minor: body medium to dark brown, appendages brownish yellow. According to Naves (1985), the shade of color in laboratory colonies fed with house flies is darker than in colonies fed only with honey.
RANGE Scattered populations occur in the West Indies (Haiti, Dominican Republic, Puerto Rico, Culebra) and southern United States (Florida; Mobile, Alabama; Houston, Texas). The native range is unknown, but may be the Greater Antilles.
BIOLOGY On Sanibel Island, Florida, I found colonies of *moerens* abundant, nesting in sandy soil at the base of trees in parks and around houses; and in Houston in a rotting tree limb on the ground of a park. Naves (1985) records nests in northern Florida from a wide range of sites, under boards, at the base of trees and fence posts, along tree roots, under palm leaves, inside wall crevices, but only rarely in the soil. According to Naves, the colonies are monogynous, with nuptial flights usually occurring in July. Colonies grow to populations of 600 or more workers, of which somewhat fewer than 20 percent are majors. In nature they feed on seeds and insects, the latter taken alive or scavenged.

FIGURE Upper: holotype, major. Lower: paratype, minor. FRENCH GUIANA: Kaw Mountains, 45 km marker (Mark W. Moffett). Scale bars = 1 mm.

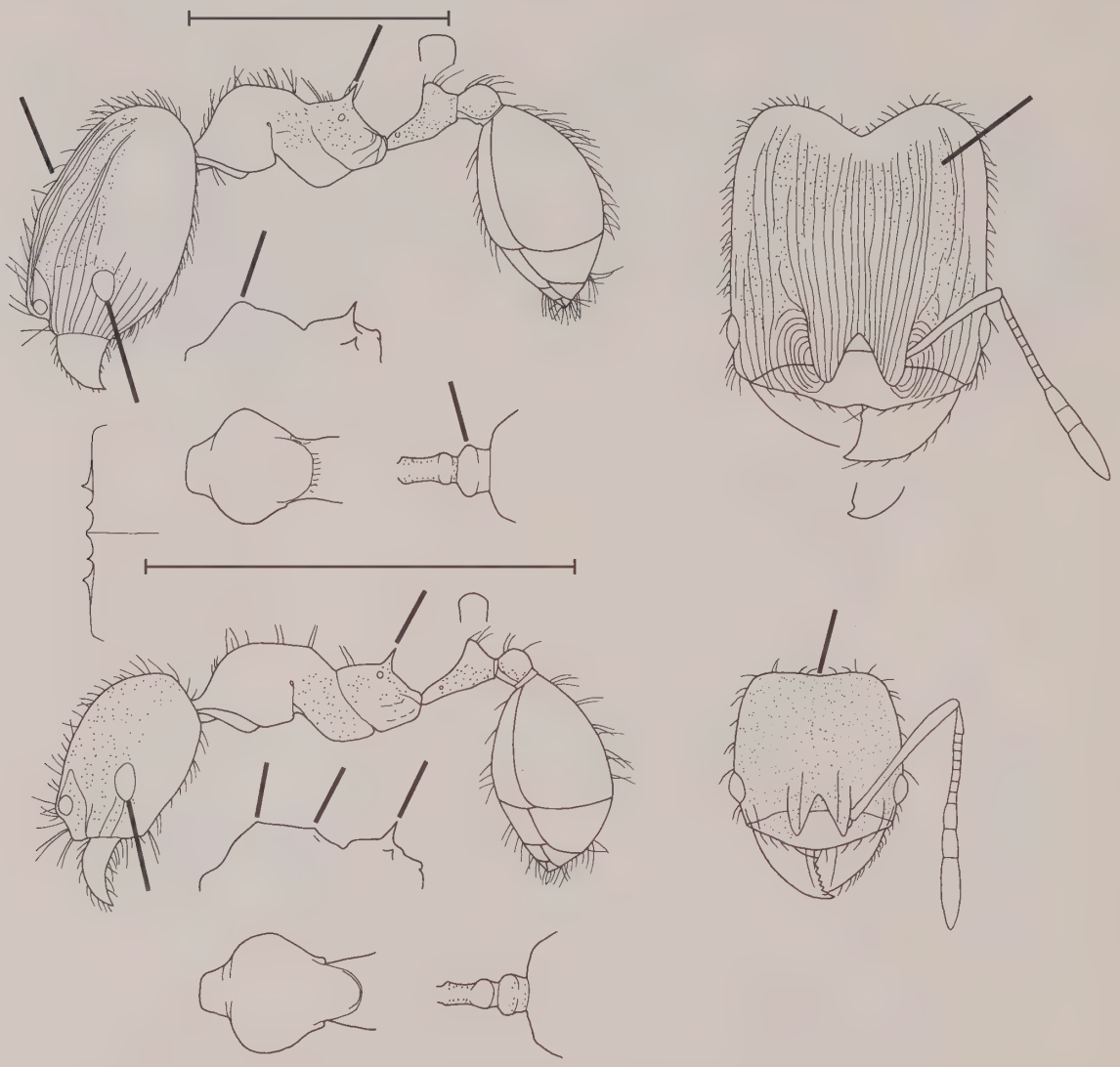


Pheidole moffetti **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named in honor of the collector and distinguished naturalist Mark W. Moffett.
DIAGNOSIS A medium-large, mostly brown member of the *flavens* group, distinguished in the **major** by the completely carinulate sculpturing of the dorsal surface of its head, including notably all of the clypeus; the nearly perfect semicircular profile of the promesonotum in side view; trapezoidal postpetiolar node; rugose mesopleuron; and long pilosity; and in the **minor** by the bicolorous condition of the body. Close to *bidens* and *styrax,* but among other details, lacking teeth on the anterior clypeal border.
See also the less similar *nasutoides* and *tennantae*.
MEASUREMENTS (mm) Holotype major: HW 1.04, HL 1.04, SL 0.58, EL 0.14, PW 0.50.
Paratype minor: HW 0.50, HL 0.54, SL 0.48, EL 0.10, PW 0.34.
COLOR Major: head medium reddish brown, rest of body medium brown, appendages brownish yellow.
Minor: gaster dark brown, rest of body and appendages light reddish brown.
RANGE Known only from the type series.
BIOLOGY Collected along the Kaw Mountains road at the edge of rainforest.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Monteverde, 1400 m (Stefan Cover). Scale bars = 1 mm.



Pheidole monteverdensis **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the type locality, a famous mountain reserve in Costa Rica.

DIAGNOSIS Similar in various traits to *albipes, alticola, browni, chalca, hedlundorum, euryscopa, lustrata, palenquensis,* and *servilia,* and distinguished as follows.

Major: dark brown; eye broadly oval and set well forward on head; posterior dorsal profile of head flat; humerus in dorsal-oblique view lobose; propodeal spines moderately long and slender; postpetiole from above elliptical; almost all of dorsal head surface except occiput, frontal triangle, and midclypeus carinulate; carinulae originating on frontal lobes curve inward slightly, toward midline.

Minor: dark brown; eye large, elliptical; pilosity sparse; in dorsal-oblique view humerus and mesonotal convexity subangulate; head mostly foveolate, and promesonotum smooth and shiny.

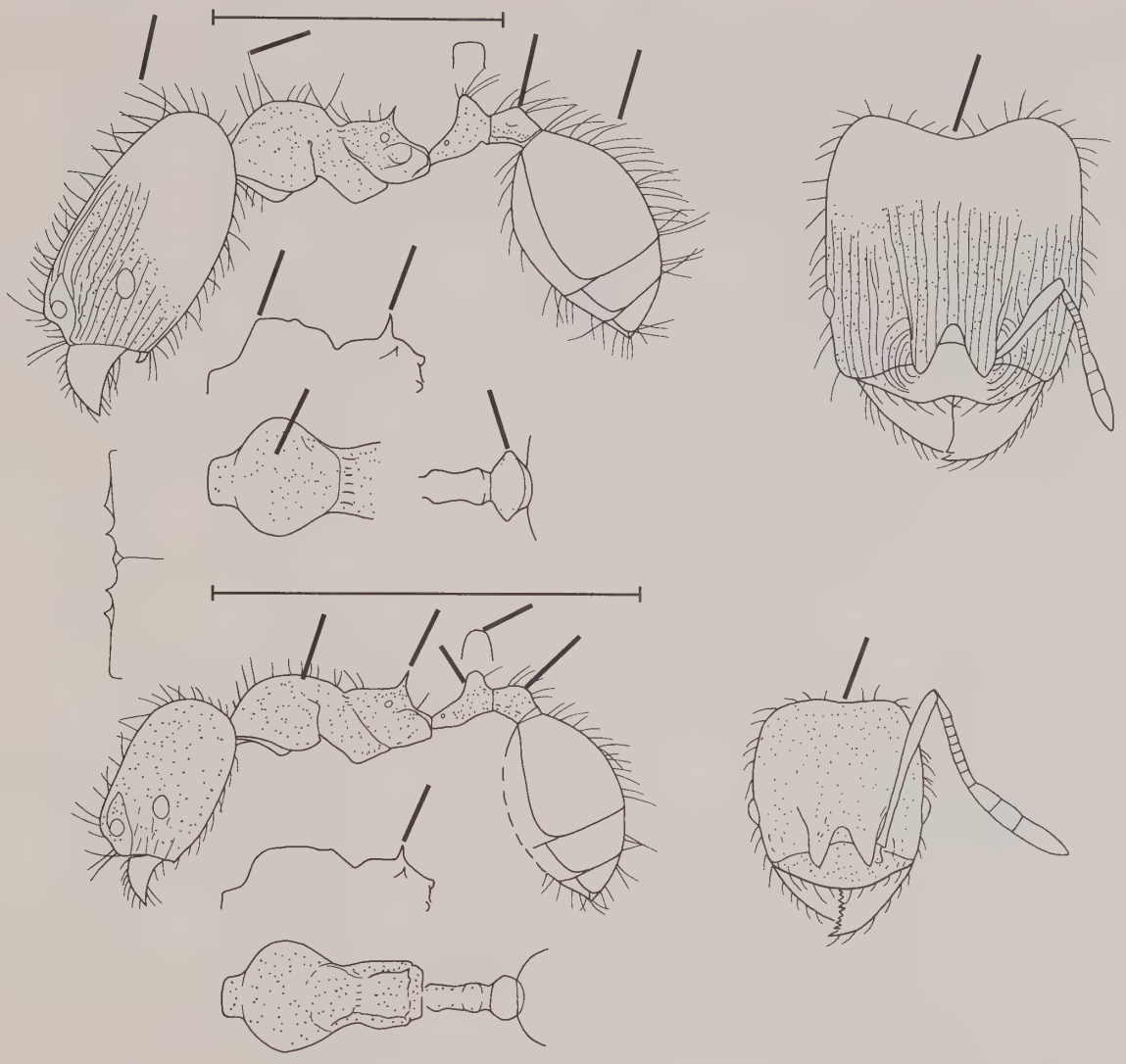
MEASUREMENTS (mm) Holotype major: HW 0.78, HL 0.94, SL 0.42, EL 0.14, PW 0.40.
Paratype minor: HW 0.46, HL 0.50, SL 0.40, EL 0.14, PW 0.28.

COLOR Major: body, mandibles, and scapes dark brown; funiculus and legs medium brown.
Minor: body mostly dark brown; anterior one-fourth of head capsule, and appendages, medium brown.

RANGE Cloud forest in Costa Rica, 1200–1600 m (Longino 1997).

BIOLOGY According to Longino (1997), *monteverdensis* is a dominant ant in cloud-forest leaf litter, but drops out abruptly below 900 m. Nests have been found in pieces of rotting wood in the leaf litter, and one in the clasping petiole of a non-myrmecophytic *Piper*. A seed cache was discovered in the latter nest.

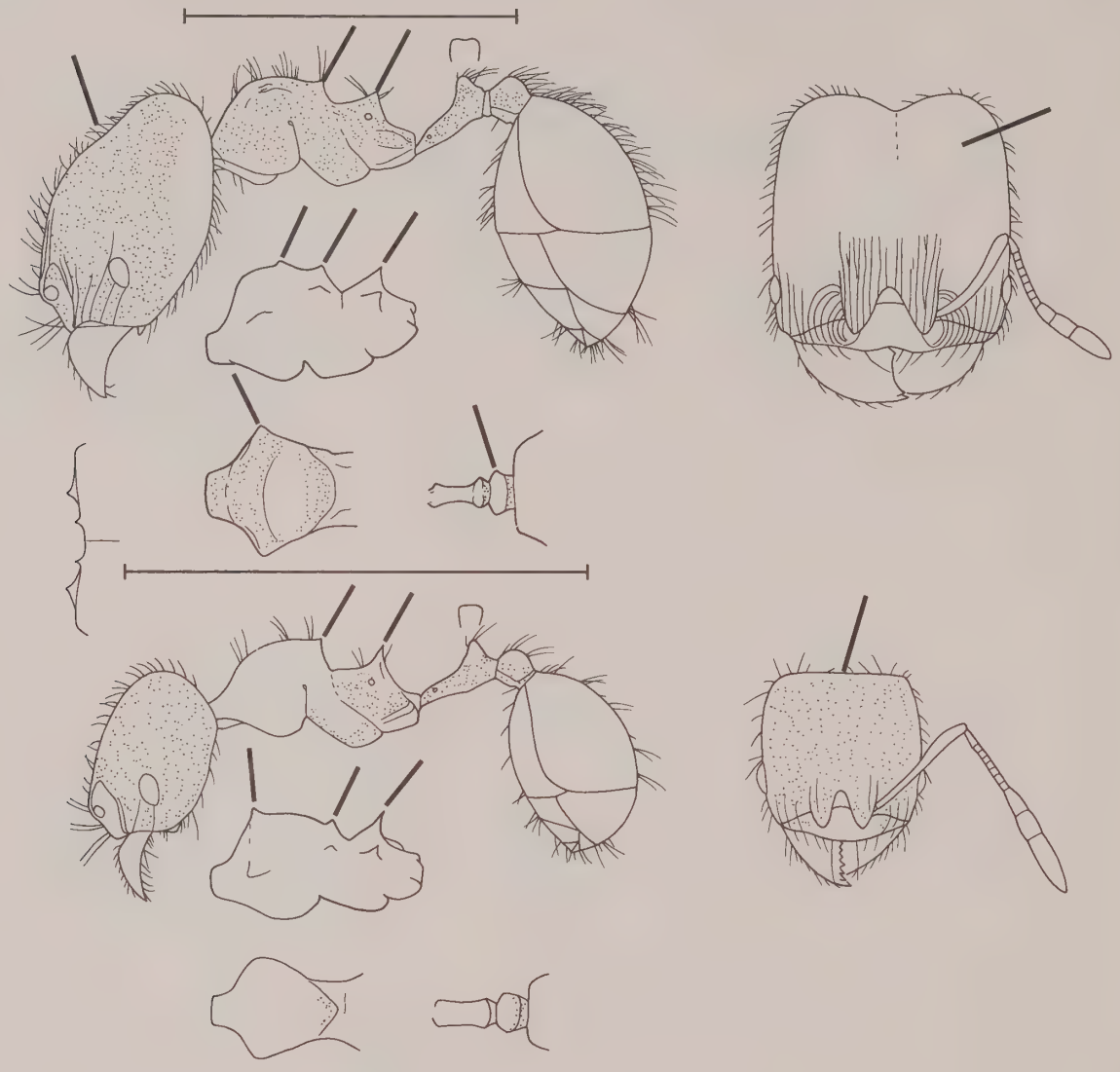
FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: Miacatlan, Morelos (A. B. Hamton). Scale bars = 1 mm.



Pheidole morelosana **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the Mexican state of origin of the type colony.
DIAGNOSIS *Pheidole morelosana* is similar in various traits to the species listed in the heading above, distinguished as follows.
Major: dark yellow; occiput broad and deep; pilosity dense and very long, many hairs much longer than Eye Length; humerus subangulate in dorsal-oblique view; propodeal spines long, nearly vertical to propodeal basal face in dorsal-oblique view; promesonotal profile flat in side view; postpetiolar node very low in side view and spinose from above; mesosoma entirely foveolate and opaque.
Minor: eye small, oval; all of head and mesosoma foveolate and opaque; petiolar node broad and rounded at apex; postpetiolar node low; occiput broad, its margin concave.
MEASUREMENTS (mm) Holotype major: HW 0.78, HL 0.88, SL 0.42, EL 0.08, PW 0.44.
Paratype minor: HW 0.44, HL 0.50, SL 0.42, EL 0.06, PW 0.28.
COLOR Major: concolorous dark yellow except for antennae and tarsi, which are pale yellow.
Minor: concolorous medium yellow except for tarsi, which are pale yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

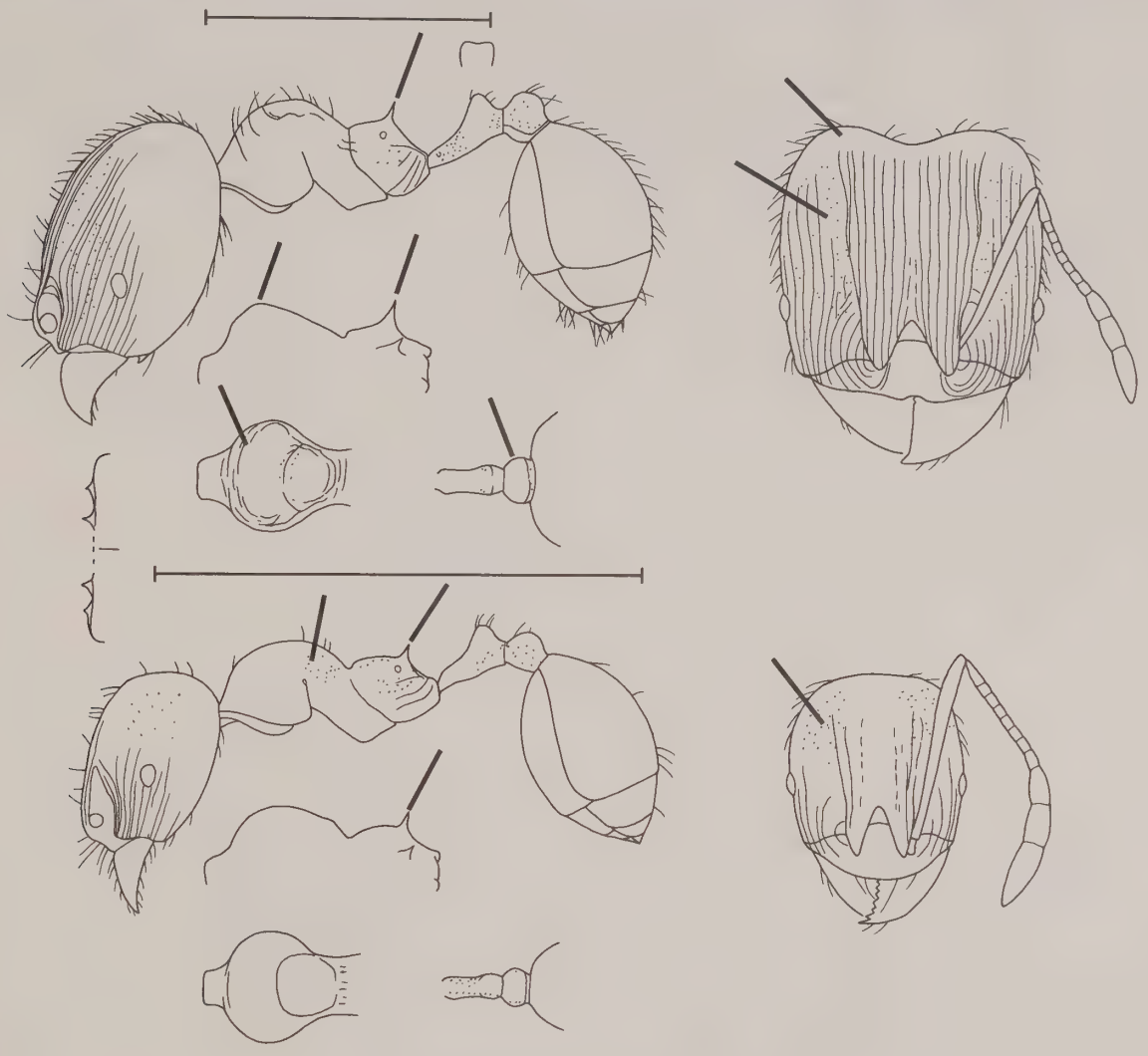
FIGURE Upper: holotype, major. Lower: paratype, minor. PANAMA: Barro Colorado Island. Scale bars = 1 mm.



Pheidole multispina **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *multispina,* many spines.
DIAGNOSIS A very distinctive little species similar to the species listed in the heading above, but easily recognized as follows.
Major: in side view, promesonotal convexity raised as a right angle that drops off through a long, steep face to the metanotum; in dorsal-oblique view the pronotum, mesonotum, and propodeum each bear conspicuous paired angles or spines; the pronotal angles from above extend far beyond the rest of the pronotum below, and the propodeal spines are large and equilaterally triangular; head quadrate in full-face view, with posterior half smooth and anterior half partly carinulate; posterior half of dorsal head profile weakly concave; all of mesosoma and dorsal surface of head foveolate.
Minor: mesosoma configured as described for major; occiput very broad and flat.
MEASUREMENTS (mm) Holotype major: HW 0.70, HL 0.72, SL 0.34, EL 0.12, PW 0.40.
Paratype minor: HW 0.40, HL 0.40, SL 0.32, EL 0.06, PW 0.24.
COLOR Major: head and mandibles light brown; mesosoma and other appendages medium brown; gaster dark, almost blackish brown.
Minor: the Panamanian types are dark brown; specimens from Costa Rica vary from reddish yellow to reddish brown.
RANGE Occurs in tropical forests in Panama and, according to Longino (1997), the southwestern lowlands of Costa Rica.
BIOLOGY In Costa Rica, Longino (1997) found a colony nesting in a flat cavity beneath loose bark on top of a rotten log; and in Panama, Alfred E. Emerson found it in small cavities inside a rotten log.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Mato Grosso. Scale bars = 1 mm.



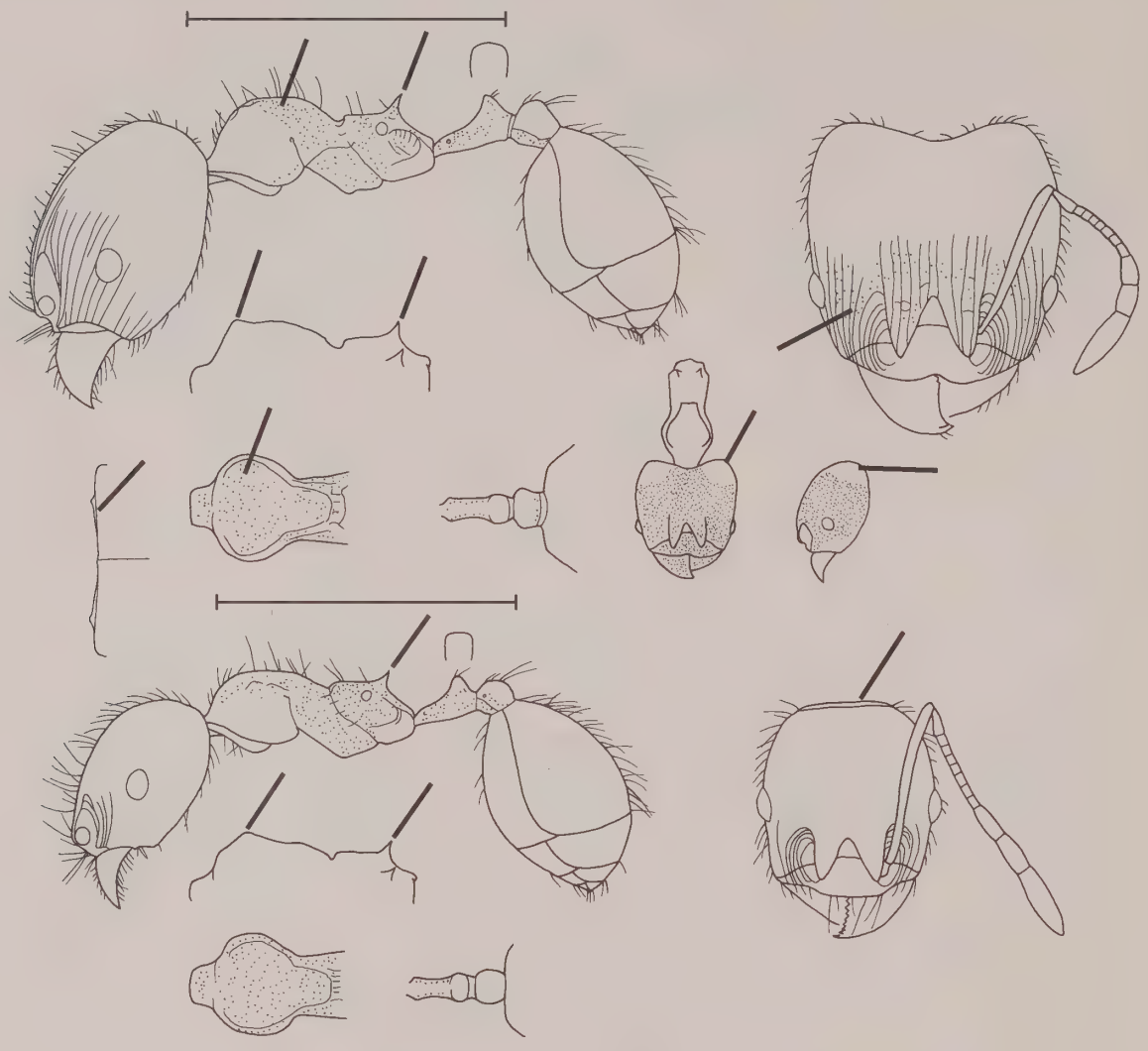
Pheidole nana Emery

Pheidole nana Emery 1894d: 158. Raised to species level in this monograph: *subreticulata*.

TYPES Mus. Civ. Stor. Nat. Genova.
ETYMOLOGY L *nana,* dwarf, alluding to small size.
DIAGNOSIS A medium-sized member of the *flavens* group, most similar to *borgmeieri,* differing from it and other species of the group as follows.
Major: profile of promesonotum in side view forming a single, smooth, near perfect semicircle; in dorsal-oblique view, humerus rises well above the remainder of the pronotum and the mesonotum; propodeal spine long and thin; postpetiolar node from above bell-shaped; carinulae cover dorsal surface of head except for occiput as spaces next to the posterior reaches of the frontal carinae, as well as the frontal triangle and mid-clypeus; anterior margin of pronotum carinulate.
Minor: profile of promesonotum forms a smooth, nearly perfect semicircle; propodeal spines relatively long and thin; frontal carinae and carinulae mesad to it reach almost to occiput.
MEASUREMENTS (mm) Lectotype major: HW 0.90, HL 0.86, SL 0.54, EL 0.08, PW 0.44.
Paralectotype minor: HW 0.46, HL 0.54, SL 0.46, EL 0.04, PW 0.32.
COLOR Major: concolorous brownish yellow.
Minor: concolorous yellowish brown.
RANGE Mato Grosso, Brazil.
BIOLOGY Unknown.

Compare with *defecta*

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (Bert Hölldobler). Scale bars = 1 mm.



Pheidole nasutoides Hölldobler and Wilson

Pheidole nasutoides Hölldobler and Wilson 1992: 16.

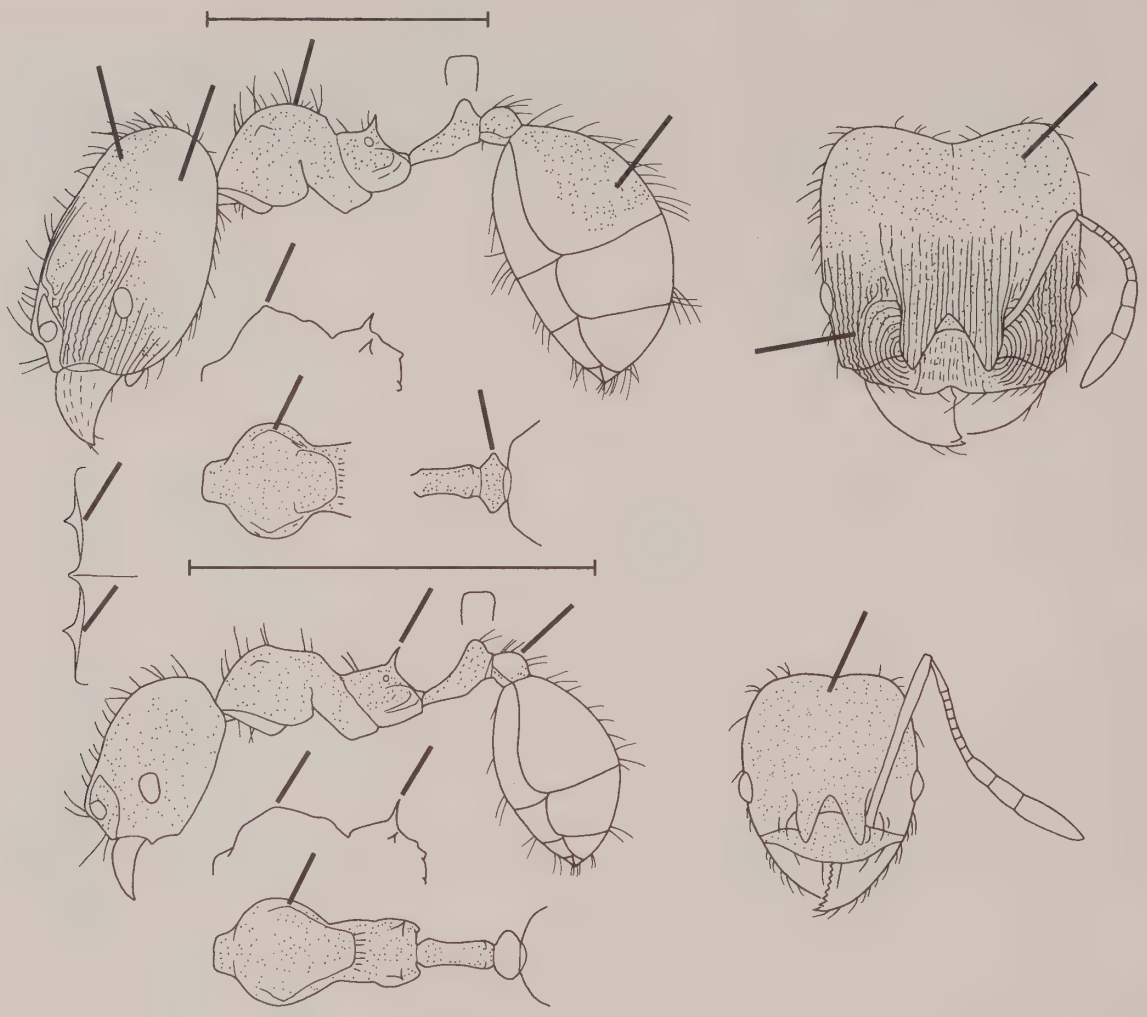
TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Compound Greek and Latin ("like nasute"), referring to resemblance of the major to a *Nasutitermes* soldier.
DIAGNOSIS A medium-sized member of the *flavens* group, whose **major** possesses 2 teeth (as opposed to the usual 4 or 5) on the hypostoma; uniquely bicolorous head (see below); promesonotum perfectly semicircular in side view and subangular in dorsal-oblique view. Also, the **minor** is unusual in its narrow occiput with nuchal collar.
Similar to *defecta* of Guatemala (known only from the major caste and placed tentatively in the *pilifera* group), differing in the shape of promesonotal and propodeal spine, sculpturing, and color.
MEASUREMENTS (mm) Holotype major: HW 0.80, HL 0.78, SL 0.50, EL 0.12, PW 0.34.
Paratype minor: HW 0.48, HL 0.54, SL 0.54, EL 0.10, PW 0.32.
COLOR Major: color medium yellow, except for a light brown "mask" as depicted in the figure; the intensity and shape of the mask varies considerably among the major workers in the type series.
Minor: concolorous medium yellow.

RANGE Known only from the type series. Repeated attempts by Hölldobler and Wilson (see 1992) and J. T. Longino (1997) to discover additional colonies at and around the type locality have been unsuccessful, suggesting that the species is either very rare or a relatively inaccessible canopy dweller.

BIOLOGY The type colony was found in a round mass of dried, thatch-like vegetation about 1.5 meters from the ground in the moderately dense foliage of a small tree at the border of open experimental fields of the La Selva Biological Station. When the nest was disturbed, more than a hundred major and minor workers rushed out and ran in erratic looping patterns to form a spreading wave away from the nest. The resemblance of the majors to *Nasutitermes* nasute soldiers similarly provoked was remarkable. In particular, the mask of the *P. nasutoides* majors is roughly shaped like the head of the nasute termites and contrasts with the light remainder of the body in the same way (Hölldobler and Wilson 1992).

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (Stefan Cover). Scale bars = 1 mm.



Pheidole nebulosa **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *nebulosa,* misty, cloudy, alluding to the general foveolate and shagreened body surface.

DIAGNOSIS Similar in various traits to *bilimeki, chalca, daphne, floridana, furtiva, quercicola, specularis,* and *stomachosa,* differing as follows.

Major: bicolored, mostly yellow (see Color); hypostoma with 2 teeth only; promesonotal profile semicircular; humerus in dorsal-oblique view low and subangulate; all of mesosoma and waist and almost all of dorsal surface of head foveolate and opaque; all of first gastral tergite but the lateral margins shagreened; spaces between eyes and antennal fossae and anterior borders of head rugulose (not rugoreticulate or carinulate).

Minor: humerus in dorsal-oblique view low and subangulate; propodeal spines long, thin, and needle-like; postpetiolar node in side view suppressed; all of head and mesosoma foveolate and opaque, but gaster entirely smooth and shiny, not shagreened.

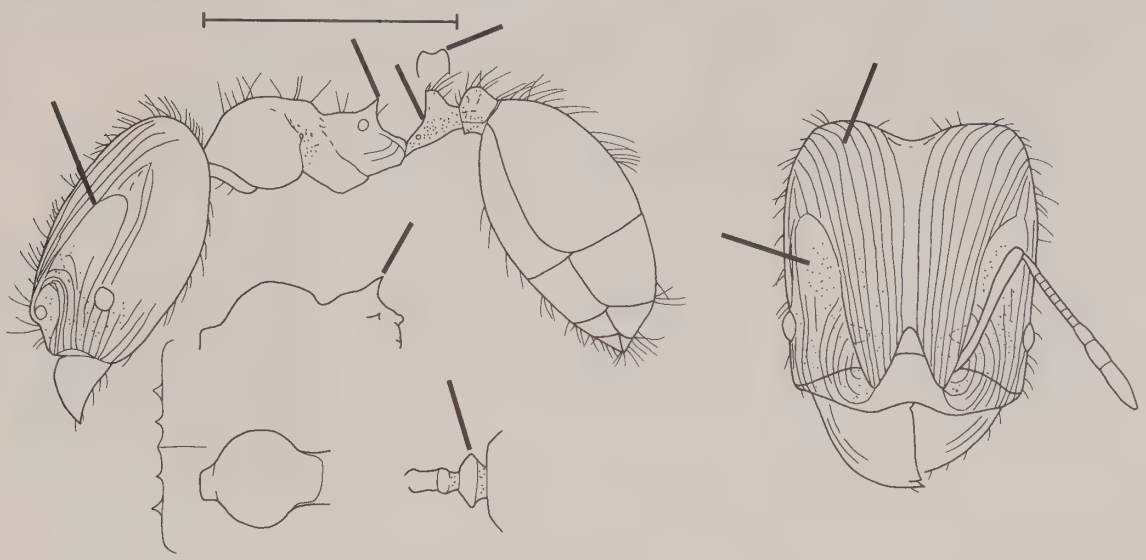
MEASUREMENTS (mm) Holotype major: HW 0.86, HL 0.92, SL 0.50, EL 0.12, PW 0.44.
Paratype minor: HW 0.42, HL 0.46, SL 0.44, EL 0.06, PW 0.28.

COLOR Major: bicolored, with body and appendages medium yellow with light reddish tinge (tending to light "orange"), and with medium brown second to terminal gastral tergites.
Minor: concolorous medium yellow with slight reddish tinge.

RANGE La Selva biological reserve and adjacent Braulio Carillo National Park to 300 m, Atlantic slope of Costa Rica (J. T. Longino 1997).

BIOLOGY *P. nebulosa* occurs both on the forest floor and in the canopy of rainforest, nesting in irregular cavities of dead wood, in *Tillandsia* epiphytes, and under dead bark and pads of moss (Longino 1997).

FIGURE Unique holotype major. CUBA: Caribarién. Scale bar = 1 mm.



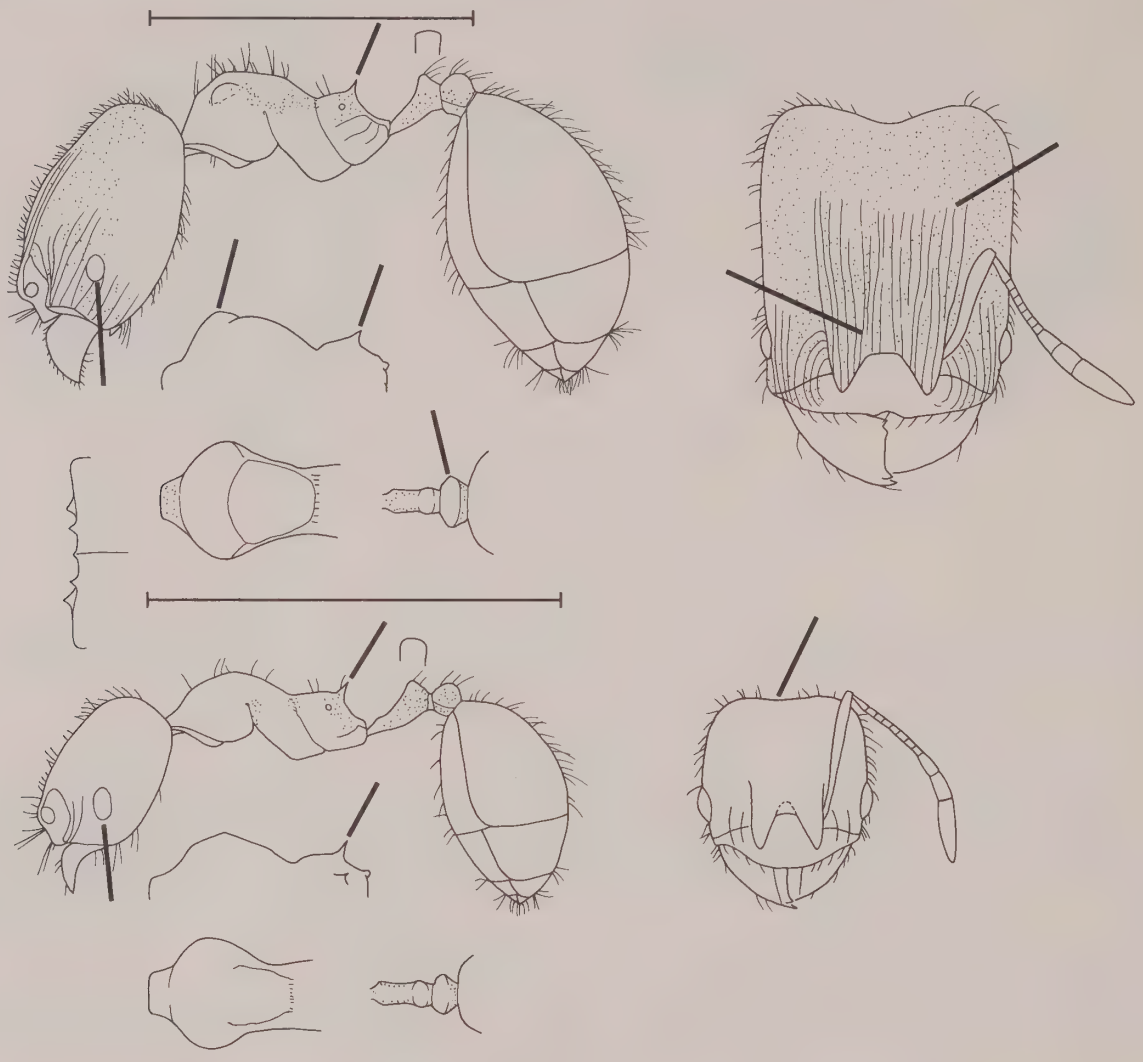
Pheidole neolongiceps Brown

Pheidole neolongiceps Brown 1950g: 250. Replacement name for *longiceps* Aguayo 1932: 218 (primary junior homonym of *longiceps* Mayr 1876: 106).

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *neolongiceps,* new (for replacement name) long-headed.
DIAGNOSIS A medium-sized, brown member of the *flavens* group whose **major** is distinguished by its elongate head; antennal scrobes; longitudinal carinulae that reach the occiput, and near the occipital border turn laterad to proceed to the occipital corners; long, thick petiolar spines that point backward, especially in dorsal-oblique view; and wide, angulate postpetiolar node.
Similar to *beloceps, charazana, longinoi,* and *prolixa,* but differing from each in various combinations of the above traits, and other traits, as shown.
MEASUREMENTS (mm) Holotype major: HW 0.82, HL 0.96, SL 0.40, EL 0.10, PW 0.46.
COLOR Major: body dark brown, appendages medium brown.
RANGE Known from the type locality and a second series I have identified from Sierra de Mesa, Pinar del Rio, Cuba (J. Fontenla).
BIOLOGY Unknown.

Compare especially *exquisita, nitella, pygmaea, sagittaria*

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (Stefan Cover). Scale bars = 1 mm.



Pheidole nigricula **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *nigricula,* little dark one.

DIAGNOSIS Similar in various traits to the species listed in the heading, differing as follows.

Major: blackish brown; very small; head elongate; frontal triangle not demarcated; eyes placed well forward on head; humerus low and lobate; propodeal spines equilaterally triangular; postpetiole from above elliptical; dorsal surface of head, including occiput but not midclypeus, foveolate; mesosoma almost entirely smooth and shiny.

Minor: carinulae limited to antennal fossae; all of head and mesosoma smooth and shiny; propodeal spines moderately long, and thin; occiput broad, its margin weakly concave, and lacking nuchal collar.

MEASUREMENTS (mm) Holotype major: HW 0.56, HL 0.70, SL 0.26, EL 0.10, PW 0.34.

Paratype minor: HW 0.34, HL 0.40, SL 0.30, EL 0.06, PW 0.24.

COLOR Major: concolorous blackish brown, appendages medium brown.

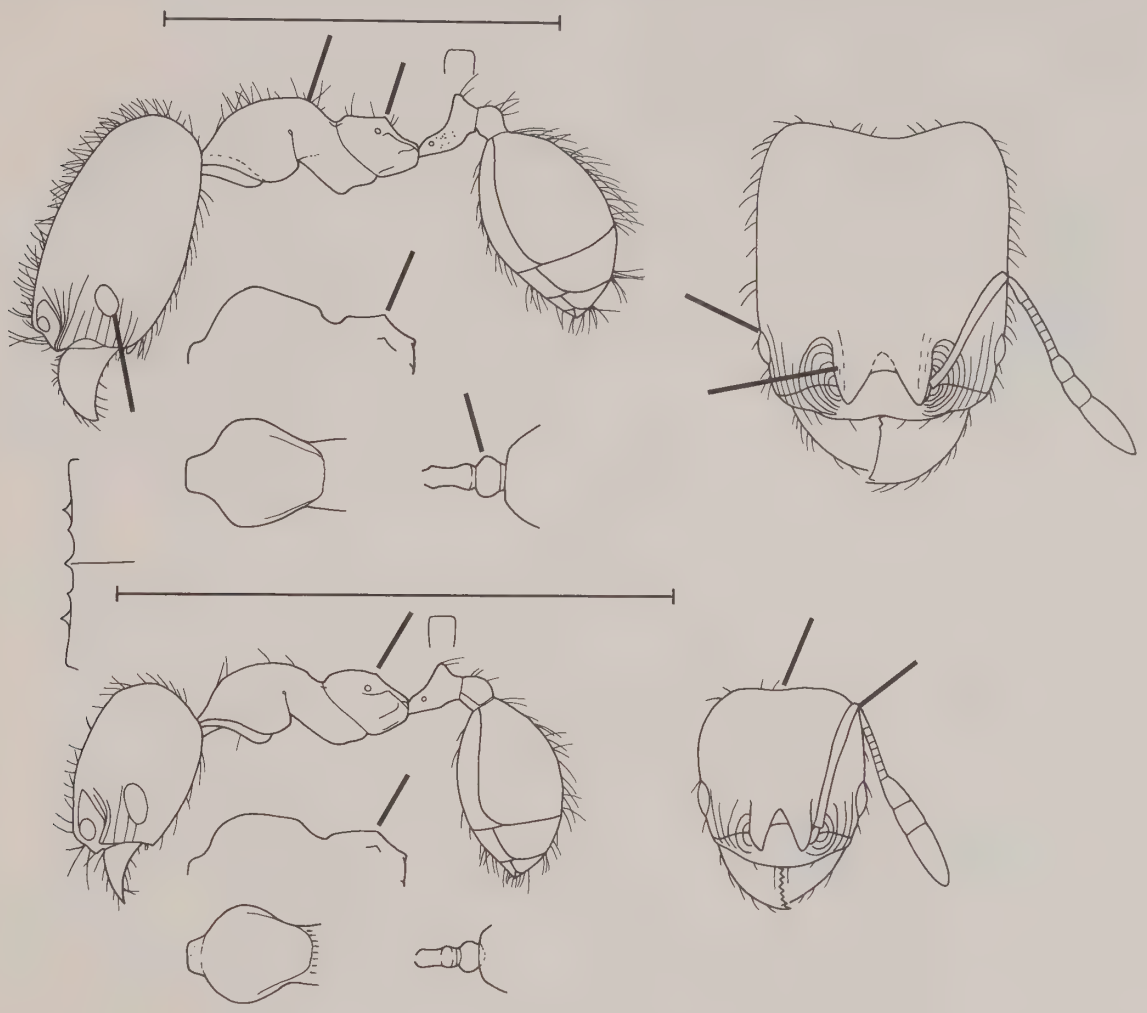
Minor: sides of mesosoma medium to dark reddish brown; rest of body, and appendages, dark, almost blackish brown.

RANGE Atlantic lowlands to 800 m in Costa Rica (Longino 1997).

BIOLOGY This tiny species inhabits mature rainforest where it nests in rotten hollow twigs in leaf litter on the forest floor.

Compare especially with *exquisita,* also *christopherseni, nigricula, olsoni, protensa, pygmaea, sagittaria*

FIGURE Upper: holotype, major. Lower: paratype, minor.
COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (Stefan Cover). Scale bars = 1 mm.

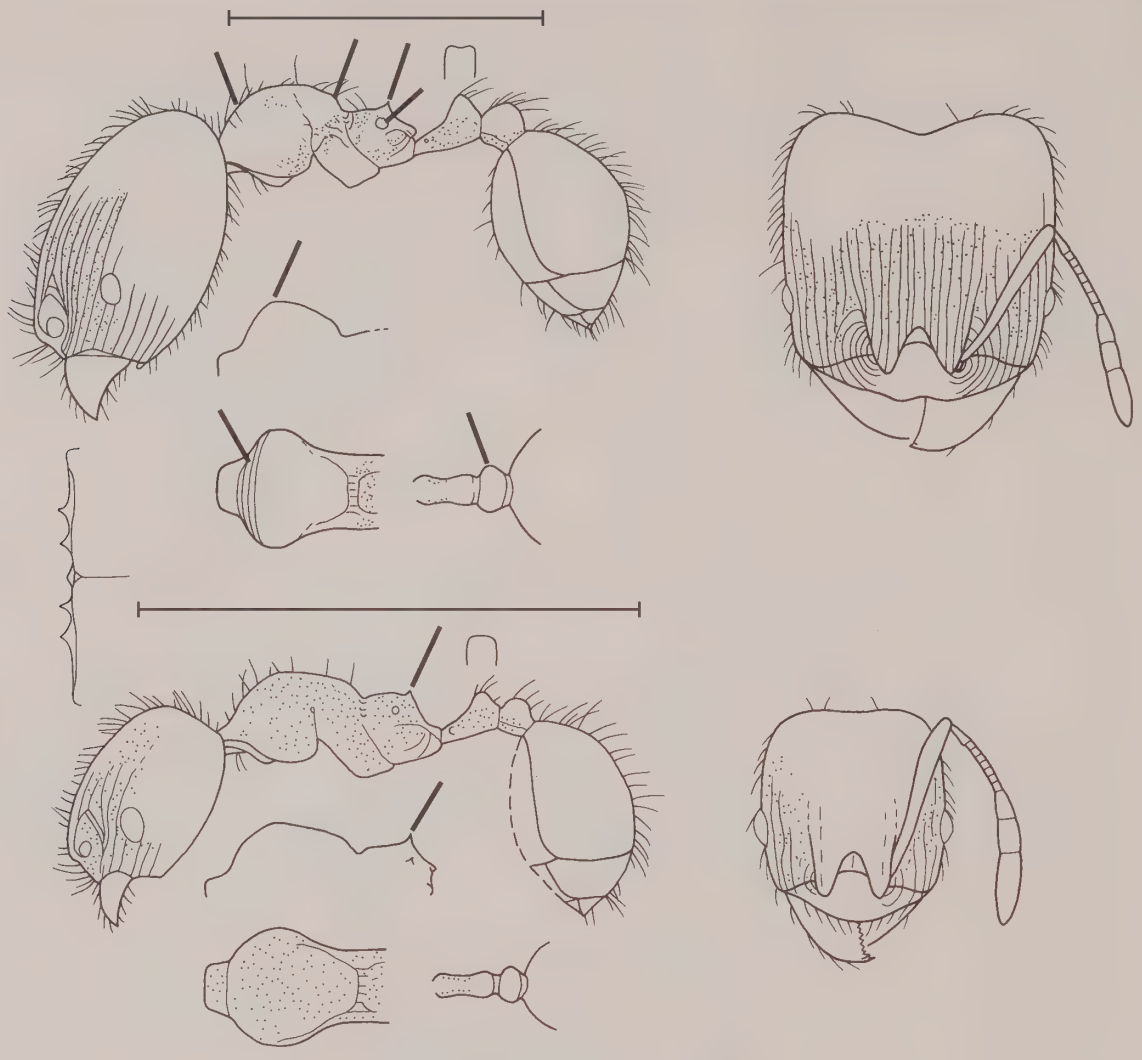


Pheidole nitella **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *nitella,* bright, splendid.
DIAGNOSIS Similar in various traits to the species listed in the heading above, and distinguished as follows.
Major: yellow; head elongate; eyes set well forward, so that their distance from anterior of head is only a little less than Eye Length; propodeal spines reduced to obtuse angles; carinulae extend on head only slightly beyond eyes and are rudimentary on frontal lobes, and rest of body is entirely smooth and shiny.
Minor: eye very large, oval (not tapered), and set far forward on head; propodeum reduced to denticles; occiput broad and weakly concave.
Differs from the closely similar *exquisita* of Ecuador in size, head shape, and details of cephalic sculpture, eye shape, and minor scape length.
MEASUREMENTS (mm) Holotype major: HW 0.58, HL 0.66, SL 0.32, EL 0.10, PW 0.30.
Paratype minor: HW 0.34, HL 0.34, SL 0.26, EL 0.06, PW 0.22.
COLOR Major and minor: concolorous medium yellow.
RANGE Occurs on the Atlantic slope of Costa Rica at 300–1000 m (Longino 1997); Chocó, Colombia, 760 m; and is widespread in montane and Amazonian Ecuador; a single collection originates from near Belém, Pará, Brazil.
BIOLOGY A rainforest dweller, *P. nitella* nests in small cavities variously in dead and live wood, on the forest floor and in the low arboreal zone (Longino 1997; Stefan Cover and E. O. Wilson, unpublished notes). A seed cache was found in one nest at La Selva Biological Station, near Puerto Viejo, Costa Rica.

Compare with *tenerescens,* and other species listed in the Diagnosis below

FIGURE Upper: lectotype, major. COSTA RICA: Puerto Jiménez, Osa Peninsula.
Lower: minor. Nevis, West Indies (Neal A. Weber), associated major compared with lectotype. Scale bars = 1 mm.

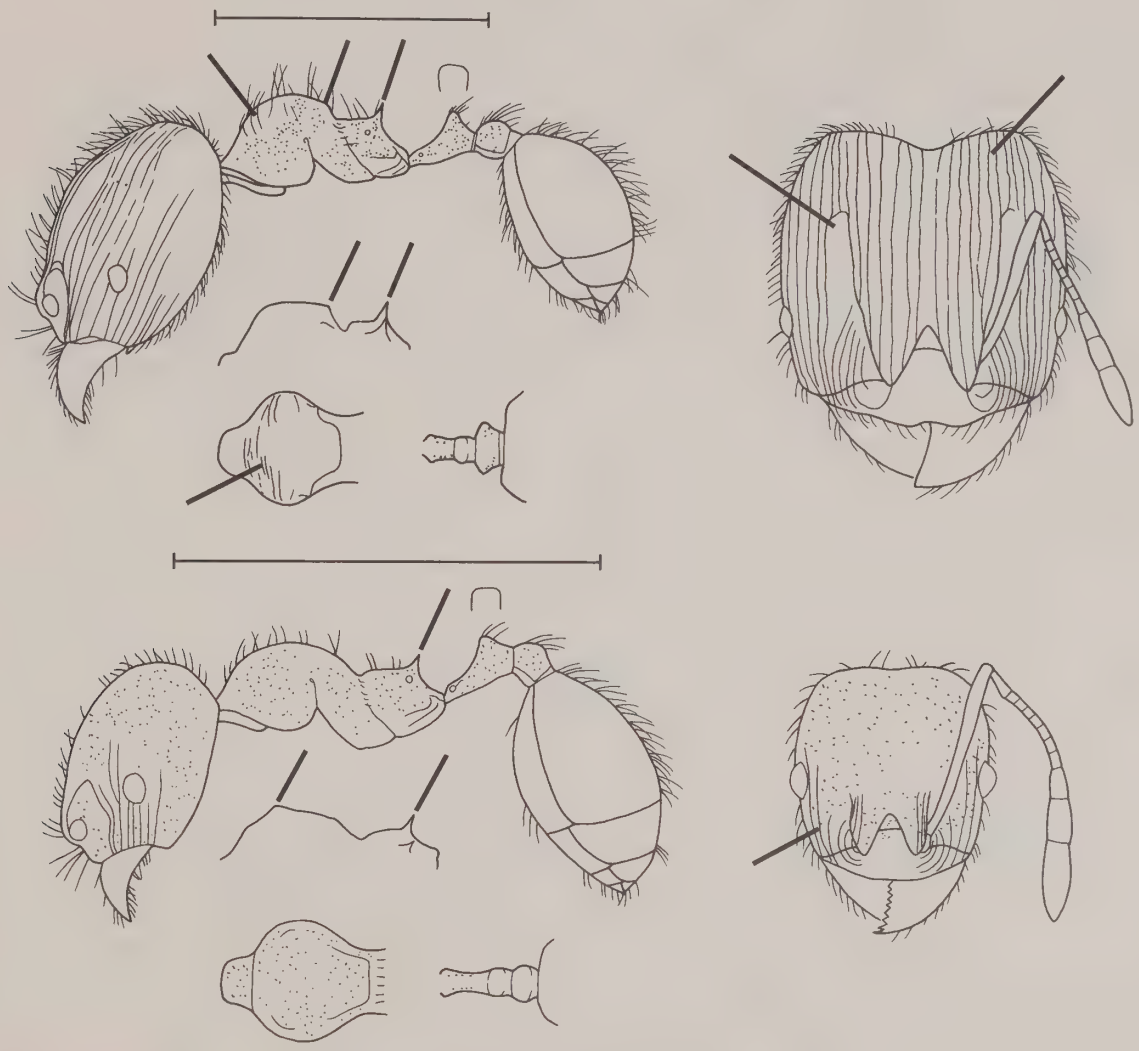


Pheidole nitidicollis Emery, **new status**

Pheidole nitidicollis Emery 1896g: 79. *Pheidole dimidiata* var. *nitidicollis* Emery 1896g: 79.

TYPES Mus. Civ. Stor. Nat. Genova
ETYMOLOGY L *nitidicollis,* shiny neck, referring evidently to the smooth rear of head.
DIAGNOSIS A small, yellow member of the *flavens* group whose **major** has a prominent, rounded humerus that rises well above the mesonotum in dorsal-oblique view, a roughly semicircular outline of promesonotum in side view, and an oval postpetiolar node. Similar to *tenerescens* but with the major possessing a low mesonotal convexity present (in side view), longer cephalic carinulae, larger propodeal spine and spiracle, and with a brown as opposed to yellow gaster.
See also the less similar *arhuaca, flavifrons, minutula,* other species listed as close to *arhuaca,* and members of the "*flavens* complex" listed under *flavens* (q.v.).
MEASUREMENTS (mm) Lectotype major: HW 0.80, HL 0.84, SL 0.44, EL 0.10, PW 0.40.
Minor (Nevis): HW 0.42, HL 0.44, SL 0.40, EL 0.06, PW 0.24.
COLOR Major and minor: yellow.
RANGE Described from Costa Rica by Emery, listed from Ceará, Brazil by Kempf (1972b), and identified by me from series collected on Nevis in the Lesser Antilles, as well as Kingston, Jamaica. *Pheidole nitidicollis* is thus widespread and may be transported (as to Nevis) by human commerce.
BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. TEXAS: New Braunfels (William M. Wheeler). Scale bars = 1 mm.



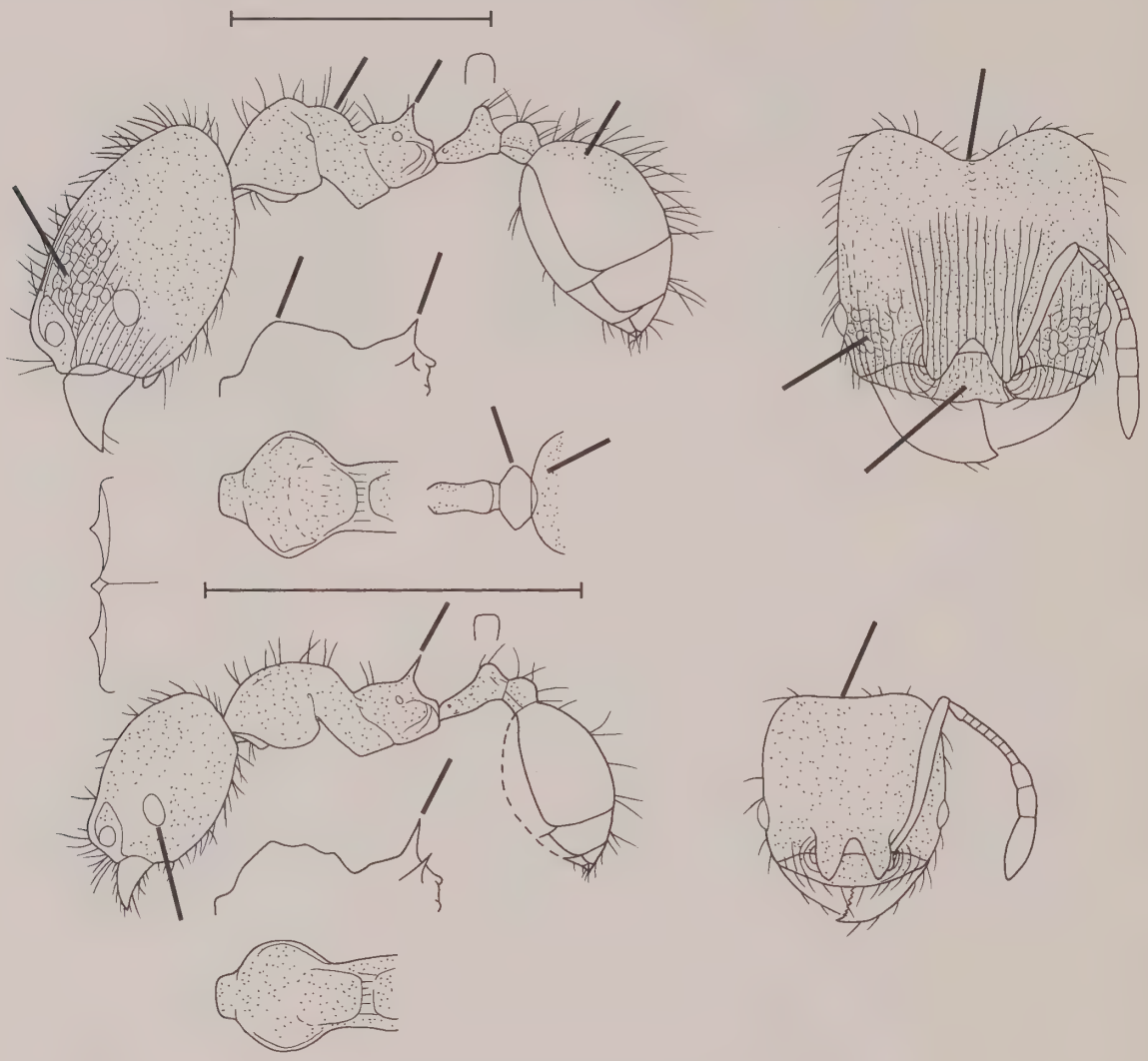
Pheidole nuculiceps Wheeler

Pheidole nuculiceps Wheeler 1908h: 473.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Unknown.
DIAGNOSIS A member of the "*flavens* complex" within the larger *flavens* group, also including *asperithorax, breviscapa, cardiella, chloe, exigua, flavens, goeldii, mittermeieri, moerens, nitidicollis, pholeops, sculptior, striatidens,* and *trinitatis,* differing in the following combination of traits.
Major: shallow antennal scrobes present, their surfaces smooth and shiny; parallel longitudinal carinulae cover all of the head surface (including the occiput) except for the center of the clypeus and frontal triangle; anterior and lateral margins of the pronotal dorsum carinulate; mesosoma and sides of waist foveolate and opaque; the strongly convex promesonotum descends to the metanotal groove through a distinct 45-degree posterior face; propodeal spines well-developed.
Minor: carinulae limited to anterior half of head capsule, including lateral margins of the frontal lobes; all of the head and mesosoma, and sides of the waist, foveolate and opaque; the remainder of the body smooth and shiny; propodeal spines well-developed.
MEASUREMENTS (mm) Lectotype major: HW 0.78, HL 0.76, SL 0.64, EL 0.10, PW 0.40.
Paralectotype minor: HW 0.44, HL 0.50, SL 0.42, EL 0.08, PW 0.30.
COLOR Major and minor: body concolorous light reddish yellow ("orange"); appendages clear medium yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *mixteca, scabriventris, tragica*

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: 10 km south of Valle Nacional, Oaxaca, 610 m (Stewart B. Peck). Scale bars = 1 mm.



Pheidole oaxacana **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the state of origin of the type colony.

DIAGNOSIS Similar in different traits to *mixteca, scabriventris,* and *tragica,* also from Mexico, differing as follows.

Major: a broad rugoreticulum occurs between eye, antennal fossa, and frontal carina on each side of the head; midclypeus partially carinulate, and carinulae travel from the frontal lobes across the vertex but fall short of the occiput; all of head and mesosoma foveolate and opaque; anterior half of central strip of first gastral tergite shagreened; occipital cleft broad and deep; propodeal spines robust and backward-directed; postpetiole from above diamond-shaped.

Minor: eye set well forward on head; propodeal spines half as long as the propodeal basal face and backward-directed; pilosity sparse; occiput broad, its margin concave, and lacking nuchal collar. All of head and mesosoma foveolate and opaque.

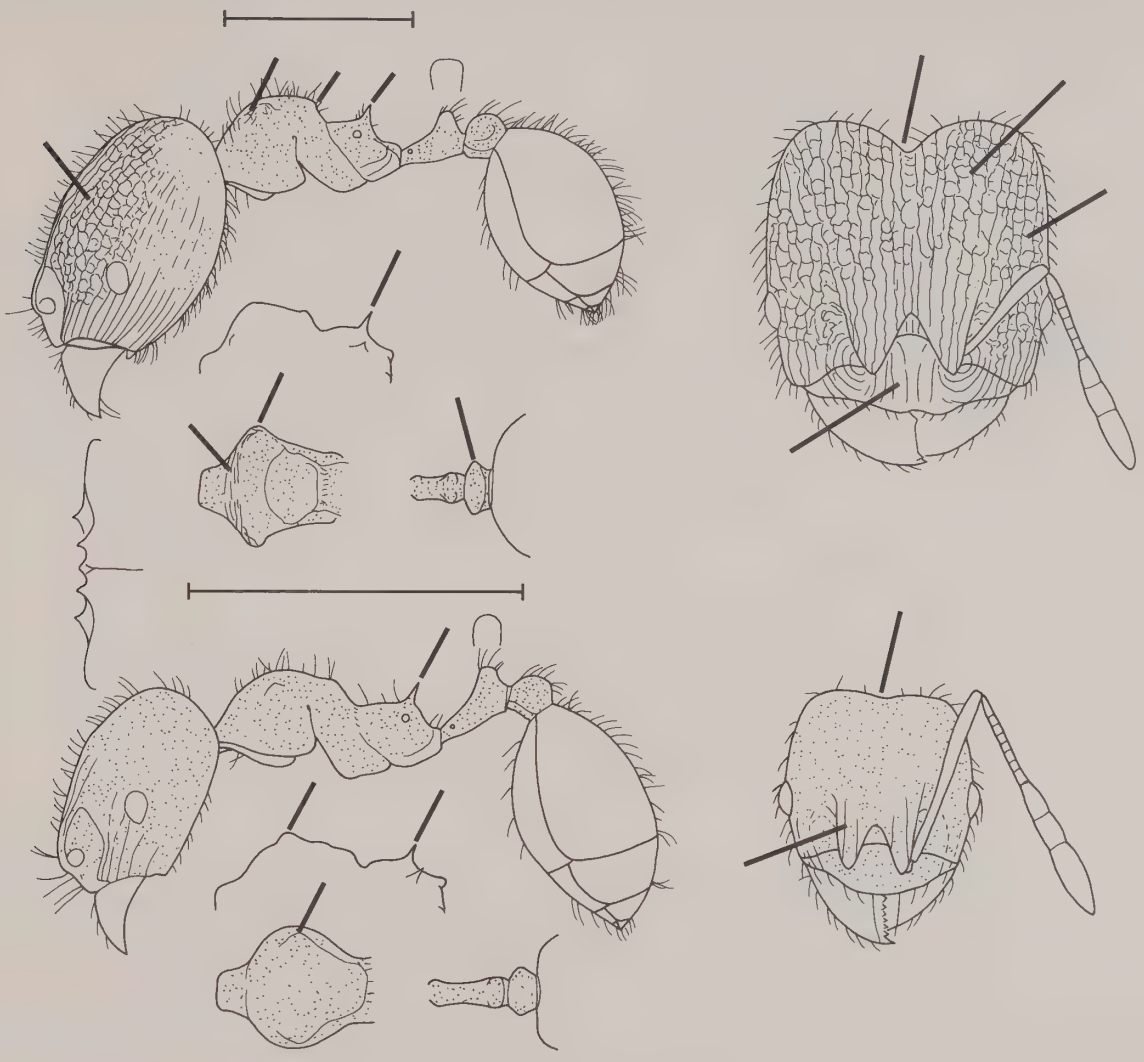
MEASUREMENTS (mm) Holotype major: HW 0.92, HL 1.00, SL 0.50, EL 0.14, PW 0.46.
Paratype minor: HW 0.50, HL 0.52, SL 0.42, EL 0.06, PW 0.32.

COLOR Major: body and mandibles medium reddish brown, other appendages dark yellow.
Minor: concolorous light reddish yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. URUGUAY (no further locality). Scale bars = 1 mm.



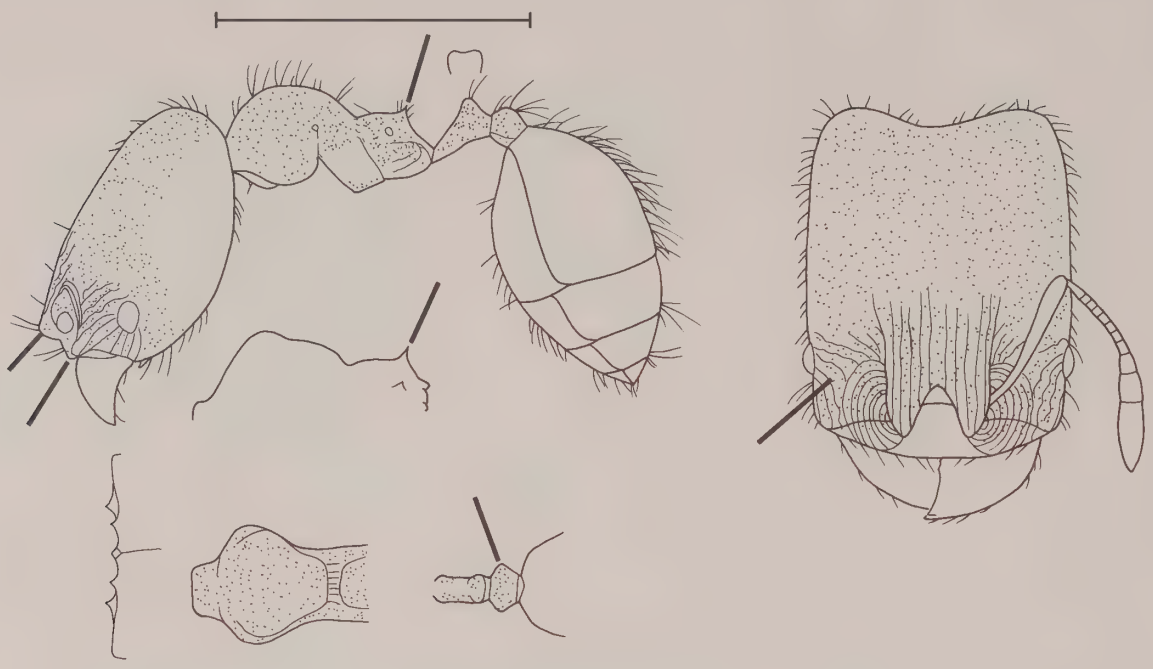
Pheidole obtusopilosa Mayr

Pheidole obtusopilosa Mayr 1887: 586. Raised to species level in this monograph: *heterothrix*.

TYPES Naturhist. Mus. Wien.
ETYMOLOGY L *obtusopilosa,* blunt-haired, allusion uncertain.
DIAGNOSIS Similar to *heterothrix,* distinguished from it and other *Pheidole* species by the following combination of traits.
Major: entire dorsal surface of head rugoreticulate except for frontal lobes, frontal triangle, clypeus, and anterior genae; humeri rugoreticulate; anterior margin of pronotal dorsum carinulate; all of mesosoma and waist foveolate; postpetiole from above elliptical.
Minor: almost all of body except gaster foveolate and opaque; humeri subangulate; propodeal spines moderately long and slender; occipital margin concave; nuchal collar absent.
MEASUREMENTS (mm) Lectotype major: HW 1.16, HL 1.18, SL 0.54, EL 0.14, PW 0.60.
Paralectotype minor: HW 0.56, HL 0.58, SL 0.50, EL 0.10, PW 0.36.
COLOR Major: body light reddish brown except for gaster, which is plain medium brown.
RANGE Recorded from Uruguay; and, in Argentina, the northern and central provinces of Buenos Aires, Córdoba, Jujuy, La Pampa, and Tucumán (Kempf 1972b). I have confirmed a series from São Paulo.
BIOLOGY A collection of *obtusopilosa* was made by William L. Brown at the Boraceia Biological Station, near Salesópolis, São Paulo, in wet mountain forest at 850 m.

Compare with *browni, casta, mera, prolixa, protensa*

FIGURE Holotype, major. COSTA RICA: Refugio de Eladio, Peñas Blancas Valley, Alajuela, 780 m (David Olson). Scale bar = 1 mm.



Pheidole olsoni **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the collector David Olson.

DIAGNOSIS Known only from the major, easily distinguished by its very small size, elongated head, bicolorous body, protuberant frontal lobe in side view, small propodeal spine, cornulate postpetiole, and unusual pattern of the rugulae mesad to the eye, which travel downward (anteriorly) from the eye obliquely mesad to meet the circular carinulae of the antennal fossae.

Similar to *browni, casta, mera, prolixa,* and *protensa,* but easily separated by the above listed traits.

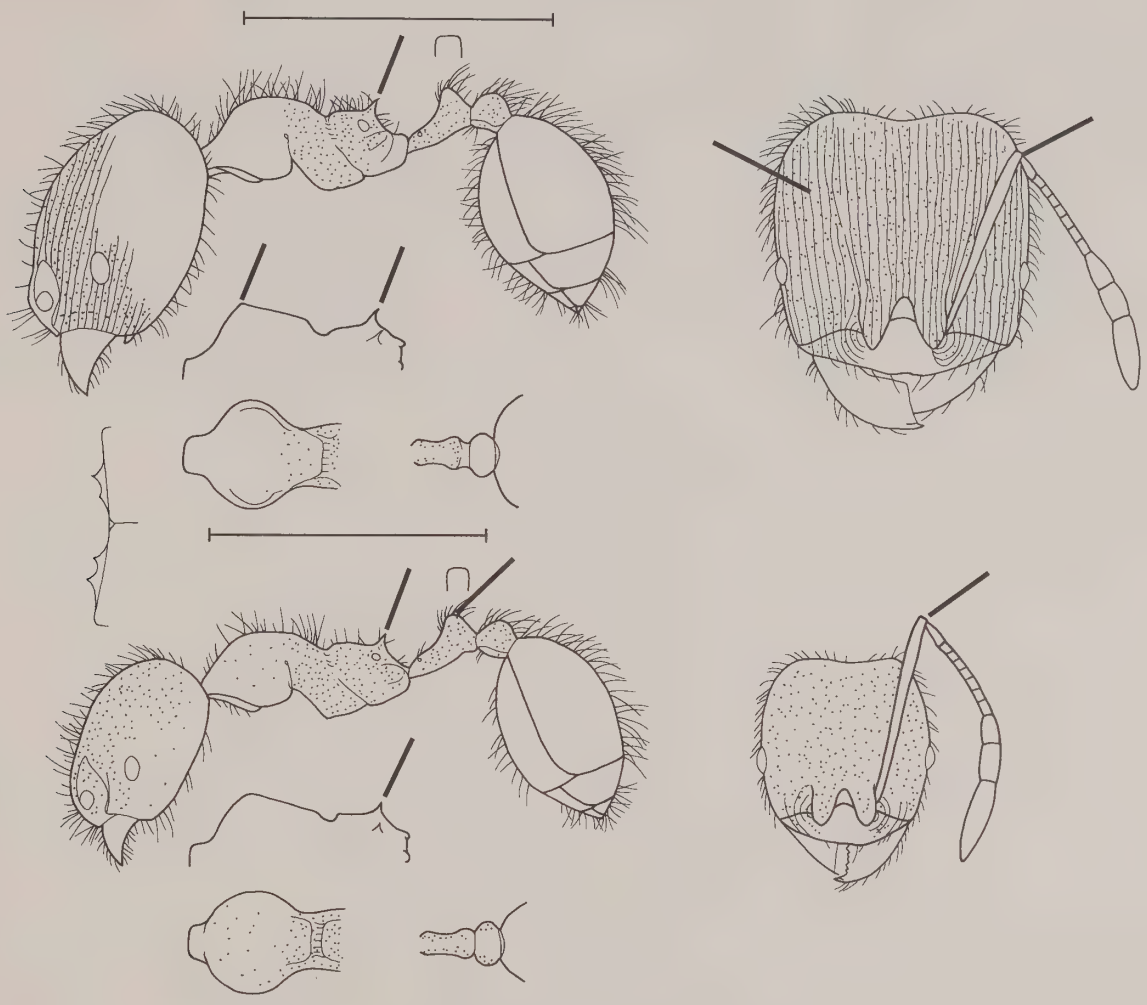
MEASUREMENTS (mm) Holotype major: HW 0.54, HL 0.74, SL 0.30, EL 0.08, PW 0.30.

COLOR Major: head, dorsum of alitrunk, petiolar node, and all of postpetiole medium brown; rest of body and all of appendages medium yellow.

RANGE Known from the type locality and from El Volcan, Chiriquí, Panama, 1280 m (L. Hare).

BIOLOGY The holotype was collected in rainforest at a tuna bait; the Chiriquí, Panama, specimens were found in a log. Males were present in the latter colony on 18 August.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (J. T. Longino). Scale bars = 1 mm.

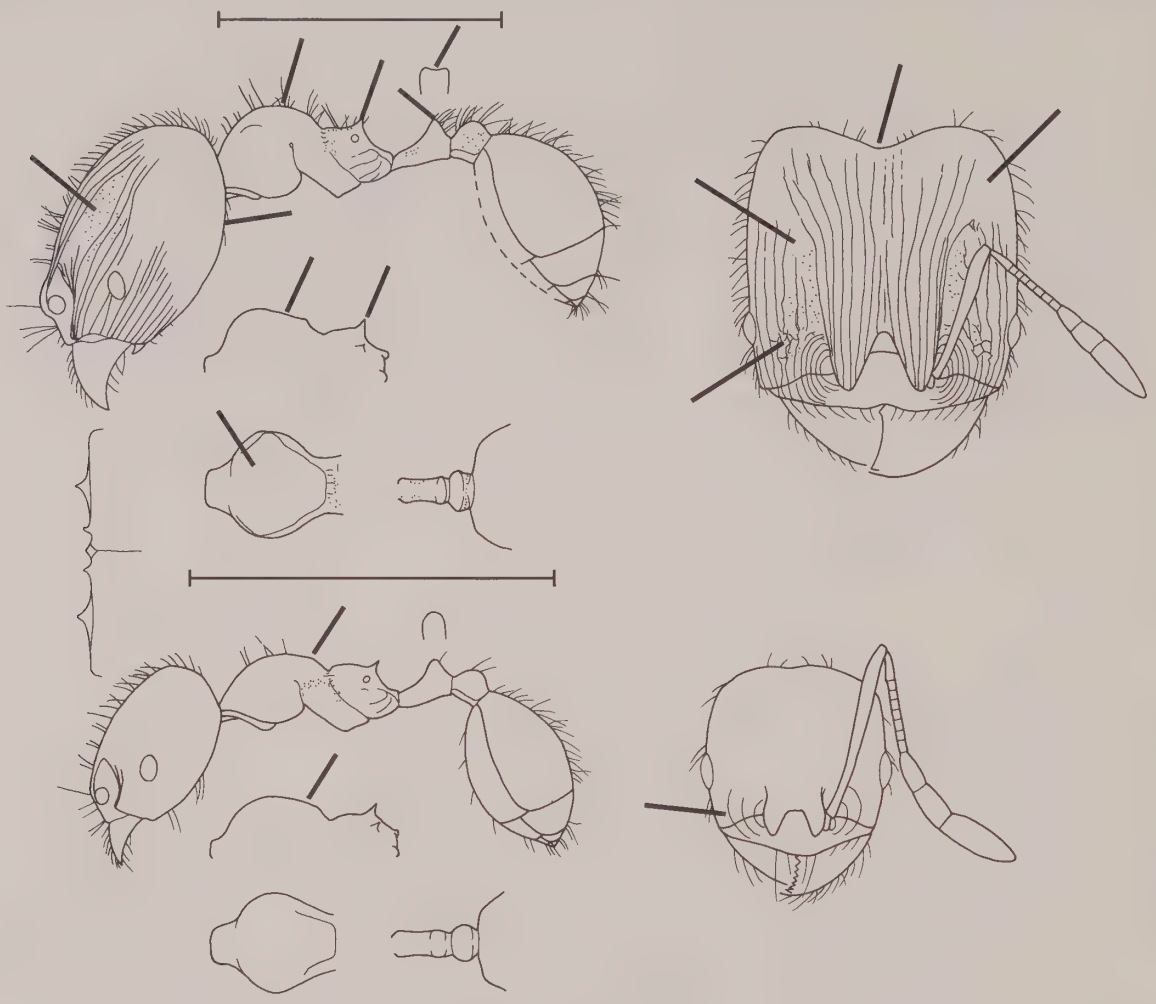


Pheidole onyx **new species**

TYPES INBio.
ETYMOLOGY Gr *onyx,* a yellowish gem stone, alluding to the color of the workers.
DIAGNOSIS A medium-sized, yellow member of the *flavens* group whose major is distinguished by slightly backward curving propodeal spines, especially in dorsal-oblique view; all of the dorsal surface of the head up to the occipital border, and not including the mid-clypeus and frontal triangle, covered by longitudinal carinulae; and pronotal humerus subangulate.
Major and **minor**: scapes exceptionally long for a *flavens*-group species, placing *onyx* intermediate to the *punctatissima* group. Similar to *citrina,* but the major of *onyx* has a less curved propodeal spine, far more carinulation on the dorsal head surface, and shorter scapes, among other differences. See also the less similar *grex* and *humida*.
MEASUREMENTS (mm) Holotype major: HW 0.80, HL 0.74, SL 0.58, EL 0.10, PW 0.38.
Paratype minor: HW 0.46, HL 0.52, SL 0.54, EL 0.06, PW 0.30.
COLOR Major and minor: concolorous medium yellow.
RANGE Atlantic lowlands of Costa Rica (Longino 1997).
BIOLOGY Nests under epiphytes in the canopy of natural wet forest (Longino 1997).

Compare with species listed
in the Diagnosis below

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ST. VINCENT, WEST INDIES (H. H. Smith). Scale bars = 1 mm.



Pheidole orbica Forel

Pheidole orbica Forel 1893j: 415.

TYPES Mus. Hist. Nat. Genève.

ETYMOLOGY L *orbica,* circular, possibly referring to the semicircular profile of the promesonotum.

DIAGNOSIS A member of the "*flavens* complex" within the larger *flavens* group, consisting of *asperithorax, breviscapa, exigua, flavens, nuculiceps, orbica,* and *sculptior,* as well as the less similar *nitidicollis* and species placed close to it (see under *nitidicollis*), differing by the following combination of traits.

Major: occiput and entire body behind the head smooth and shiny; shallow antennal scrobes present, their surfaces partly carinulate and foveate and subopaque; a small patch of rugoreticulum present just laterad to the circular carinulae of the antennal fossae; longitudinal carinulae originating on the frontal lobes reach almost to the occiput, and those just mesad to the eye reach to halfway between the eye and occipital corner; promesonotum in side view forms a near-perfect semicircle; apex of petiolar node in side view acute.

Minor: except for sparse circular carinulae around the antennal fossae, head and body entirely smooth and shiny.

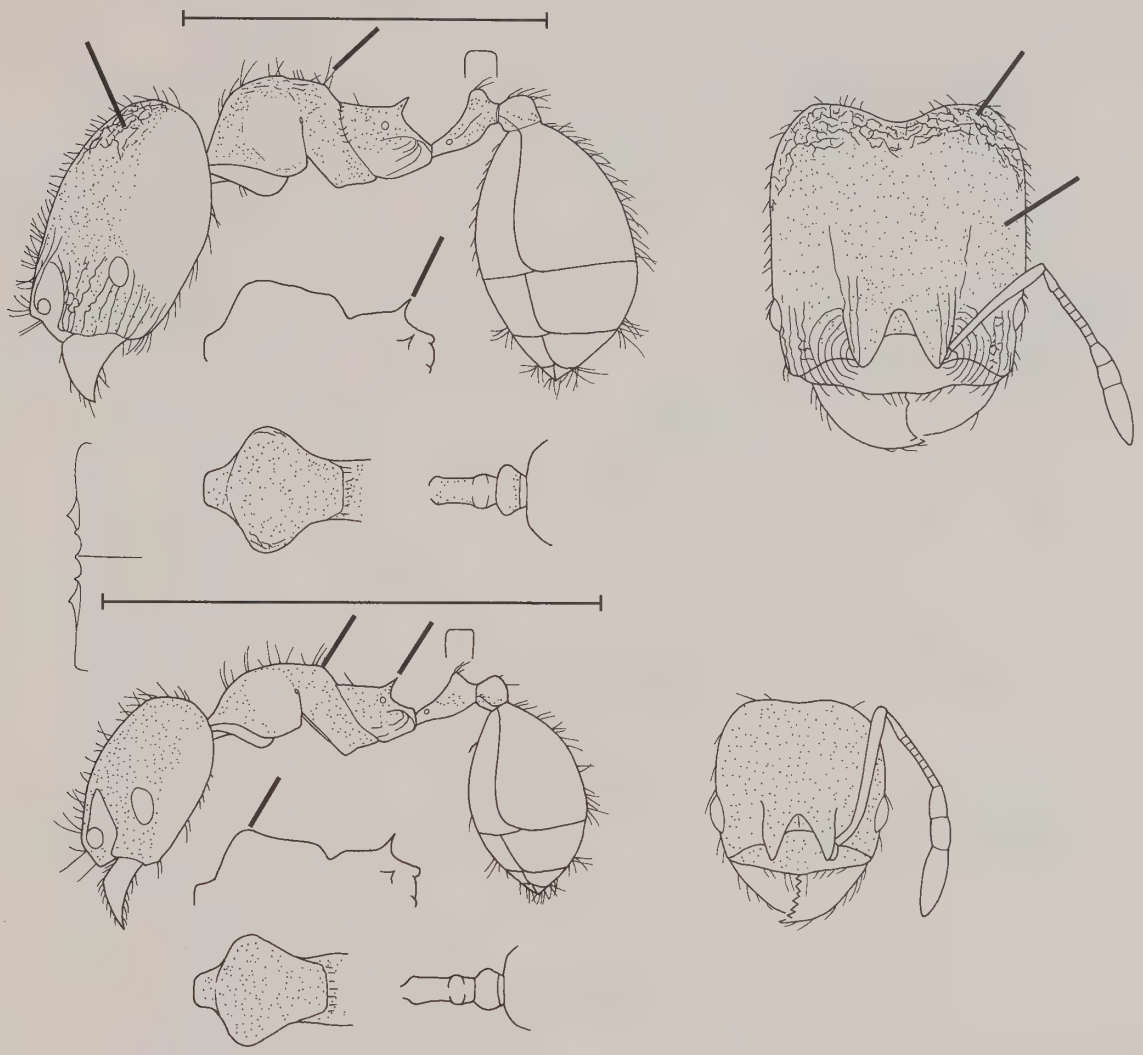
MEASUREMENTS (mm) Lectotype major: HW 0.82, HL 0.88, SL 0.42, EL 0.10, PW 0.38.
Paralectotype minor: HW 0.40, HL 0.40, SL 0.36, EL 0.06, PW 0.24.

COLOR Major: body variably brownish yellow to light reddish brown.
Minor: body yellowish brown, appendages clear yellow.

RANGE Known from St. Vincent, West Indies, and from Arroyo, Puerto Rico (J. A. Torres).

BIOLOGY *P. orbica* may be a native species on St. Vincent and is likely local in distribution; Stefan Cover and I did not encounter it during a week's collecting on the neighboring island of Grenada. H. H. Smith (in Forel 1893j) found it rare on St. Vincent, in well-developed forest, nesting in pieces of rotting wood on the ground, under stones in the soil, or, in one case, beneath sod on a stone. Each colony contained several hundred individuals.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (Stefan Cover and Mark Moffett). Scale bars = 1 mm.



Pheidole otisi **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Acronymic, referring to the Organization of Tropical Studies, sponsoring organization of the La Selva Biological Station, site of the type collection.

DIAGNOSIS A small, yellow species in the *flavens* group similar to *longinoi* and *prolixa,* distinguished in the **major** by a brown spot on the vertex of the yellow head; by the very low mesonotal convexity; stout, posteriorly directed propodeal spines; and absence of carinulae over most of the frontal lobes and entire middle half of the cephalic dorsum; and in the **minor** by the absence of a central convexity in the mesonotum, which drops steeply at the rear to the metanotal groove.

MEASUREMENTS (mm) Holotype major: HW 0.58, HL 0.66, SL 0.30, EL 0.08, PW 0.38.
Paratype minor: HW 0.36, HL 0.38, SL 0.30, EL 0.06, PW 0.24.

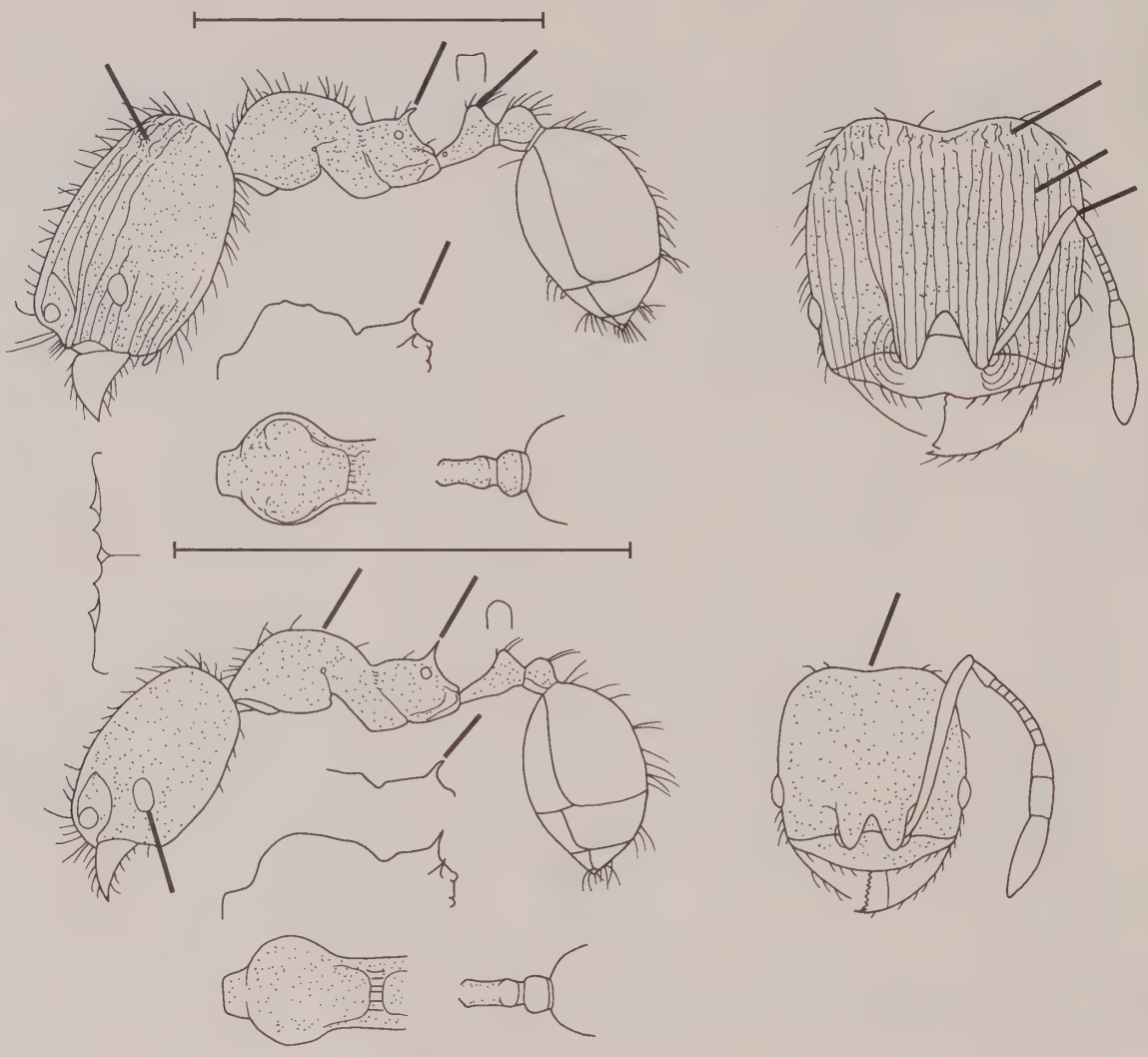
COLOR Major: gaster and appendages clear light yellow, rest of body medium yellow, with a contrasting fuzzily defined brown spot 0.1 mm across in the middle of the head one-third forward from the occipital border.
Minor: concolorous medium yellow.

RANGE The Atlantic and Pacific lowlands of Costa Rica (J. T. Longino 1997).

BIOLOGY According to Longino (1997), the species nests in pieces of dead wood in the ground litter of lowland wet forest, including beneath the bark of rotten logs. It forages on the ground and in low vegetation, and workers have been observed at extrafloral nectaries of *Passiflora pittieri*.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratypes, minor. ECUADOR: Rio Palenque Station, 47 km south of Santo Domingo de los Colorados, Pichincha, 215 m (Stewart B. and Jarmila Kukalová-Peck). Scale bars = 1 mm.



Pheidole palenquensis **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the type locality.

DIAGNOSIS Similar in various traits to *albipes, alticola, chalca, ebenina, euryscopa, lustrata, hedlundorum, monteverdensis,* and *servilia,* distinguished as follows.

Major: very small; head quadrate; dorsal occiput covered by broken, irregular rugulae, rest of dorsal head surface carinulate except for frontal triangle and midclypeus, which are smooth; all of body foveolate and opaque except gaster, which is smooth and shiny; antennal scapes moderately long, their tips touching lateral margins of the head midway between level of eyes and level of occiput; propodeal spines curved backward ("melted" in appearance).

Minor: eye oval, set well forward on head; promesonotal profile in side view perfectly semicircular; propodeal spines curved or straight; carinulae limited to antennal fossae, and all of head and mesosoma foveolate and opaque.

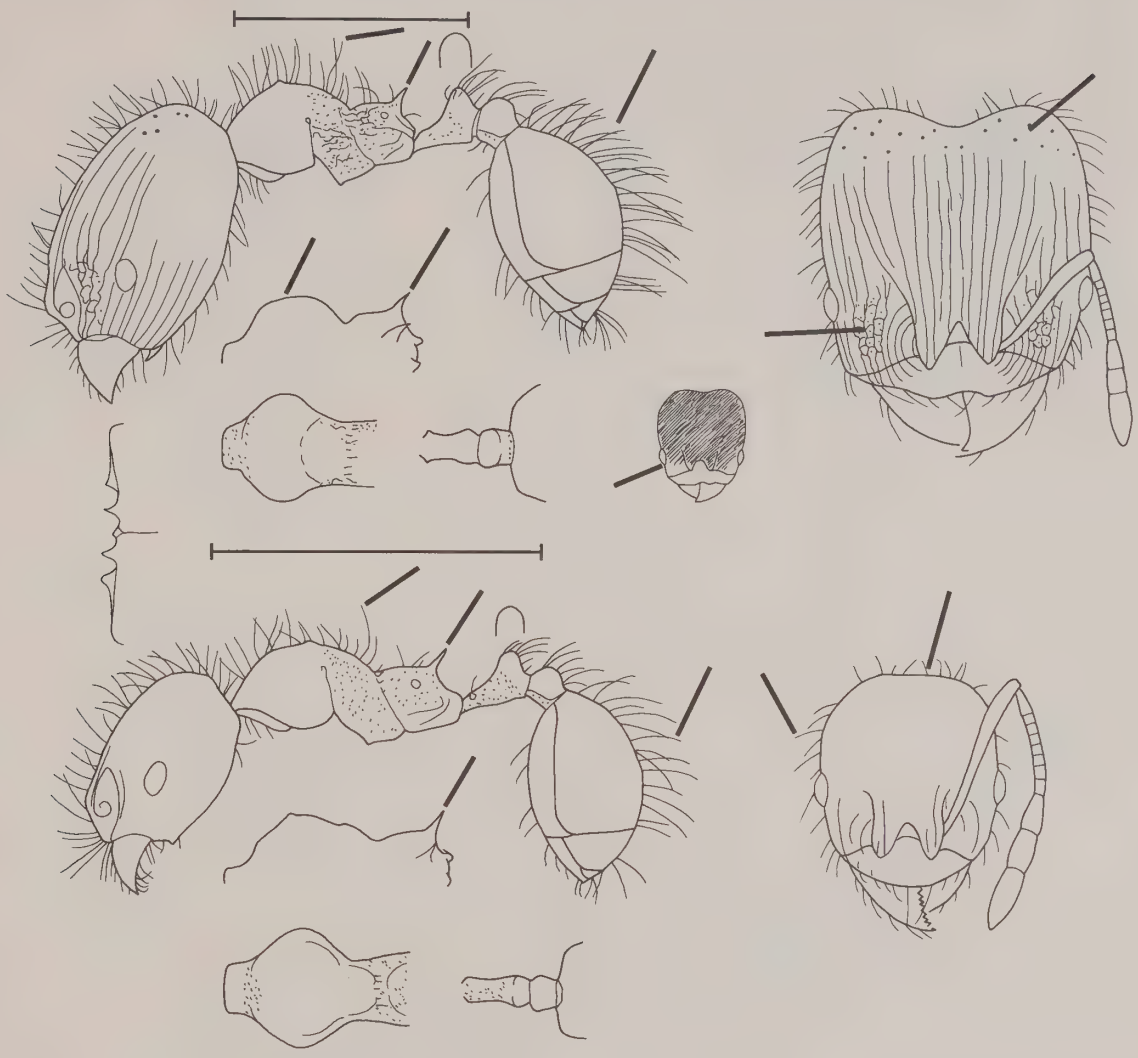
MEASUREMENTS (mm) Holotype major: HW 0.66, HL 0.66, SL 0.40, EL 0.06, PW 0.34.
Paratype minor: HW 0.42, HL 0.44, SL 0.42, EL 0.08, PW 0.26.

COLOR Major: body dark reddish yellow, appendages medium yellow.
Minor: body light brownish yellow, appendages medium yellow.

RANGE Known only from the type locality.

BIOLOGY The type series was collected in forest.

FIGURE Upper: holotype, major. Lower: paratype, minor. VENEZUELA: Cerro Huma via las Melenas, 9.7 km northwest of Irapa, Paria Peninsula, 10°41′N 62°37′W, 950 m (J. Lattke). Scale bars = 1 mm.



Pheidole pariana **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the Paria Peninsula, source of the type series.

DIAGNOSIS A medium-sized, long-haired, bicolorous species whose **major** has extensive rugoreticulum mesad to the eye, occiput covered by scattered foveae, and the remainder of the cephalic dorsum longitudinally carinulate. Close to *tennantae* of Central America and Colombia but differing in the **major** in the semicircular (as opposed to angulate) humerus; smooth (as opposed to transversely carinulate) anterior pronotal dorsum; and more extensive cephalic rugoreticulation; and in color of both the castes. Comparable differences separate both of these species *(pariana* and *tennantae)* from *breviscapa, bruchella, caracalla,* and *subreticulata.*

MEASUREMENTS (mm) Holotype major: HW 0.92, HL 0.92, SL 0.44, EL 0.14, PW 0.44.
Paratype minor: HW 0.48, HL 0.54, SL 0.46, EL 0.12, PW 0.32.

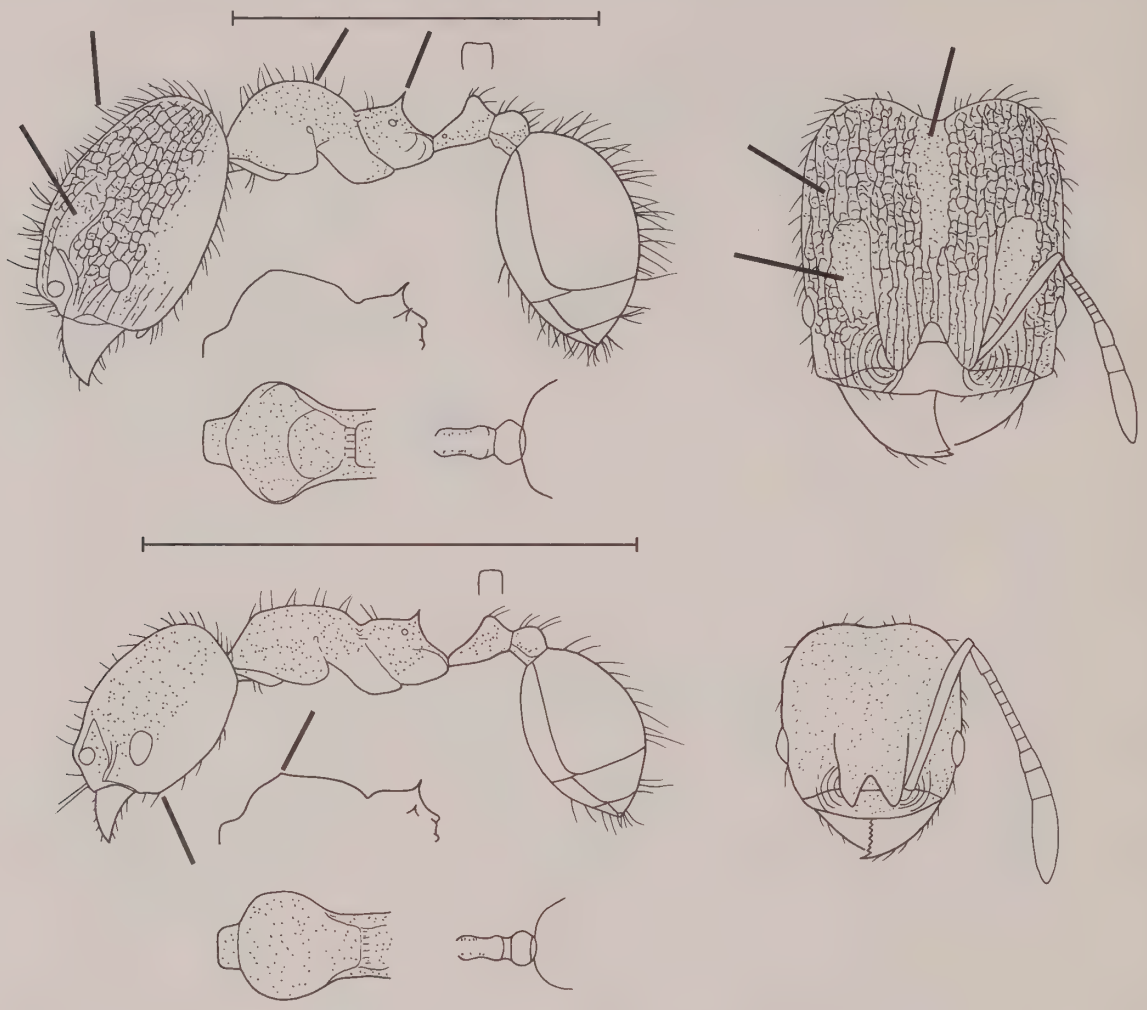
COLOR Major: bicolorous, with most of the body medium to dark brown, and the mandibles and head capsule just anterior to the eyes dark yellow. Tarsi clear yellow, rest of legs brownish yellow.
Minor: body medium to dark brown, appendages yellow.

RANGE Known only from the type series.

BIOLOGY Unknown.

Compare with *ademonia, infernalis, sospes, termitobia*

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: Utinga tract, near Belém, Pará (P. F. Darlington). Scale bars = 1 mm.



Pheidole peltastes **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *peltastes,* soldier armed with a small shield.

DIAGNOSIS Similar to the species listed in the heading above, distinguished as follows.

Major: antennal scrobes present; extensive rugoreticulum covers all the dorsal head surface from the level of the anterior margin of the eyes to the occiput, except for a median strip and the antennal scrobes.

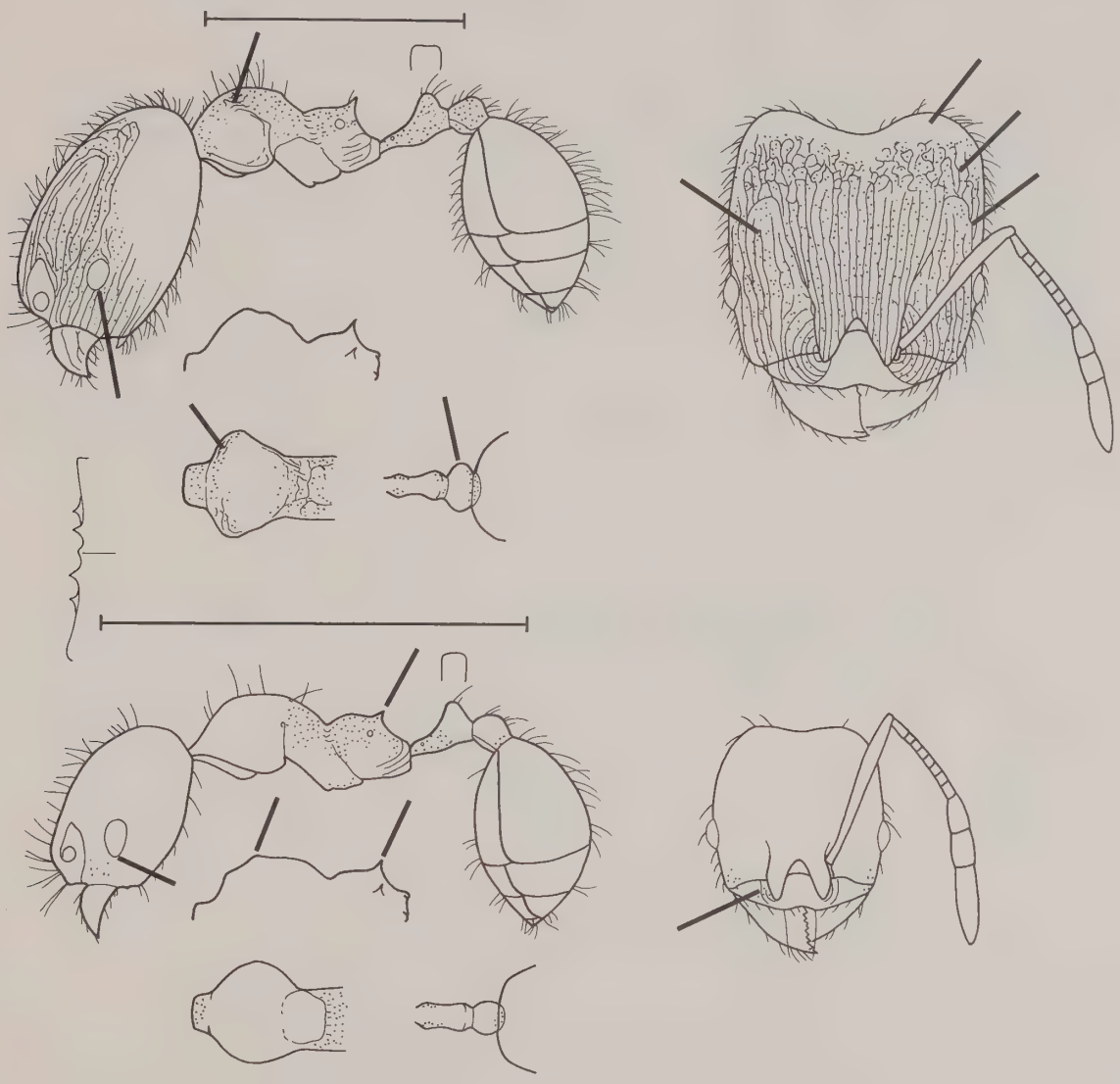
MEASUREMENTS (mm) Holotype major: HW 0.54, HL 0.60, SL 0.30, EL 0.06, PW 0.32.
Paratype minor: HW 0.36, HL 0.38, SL 0.30, EL 0.06, PW 0.22.

COLOR Major: body light reddish yellow ("orange"), appendages light yellow.
Minor: concolorous pale yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. DOMINICA (WEST INDIES): trail 0.2 km northeast of Ponte Casse, northwest slope of Morne Trois Pitons, St. Paul's Parish, 790 m (Philip D. Perkins). Scale bars = 1 mm.

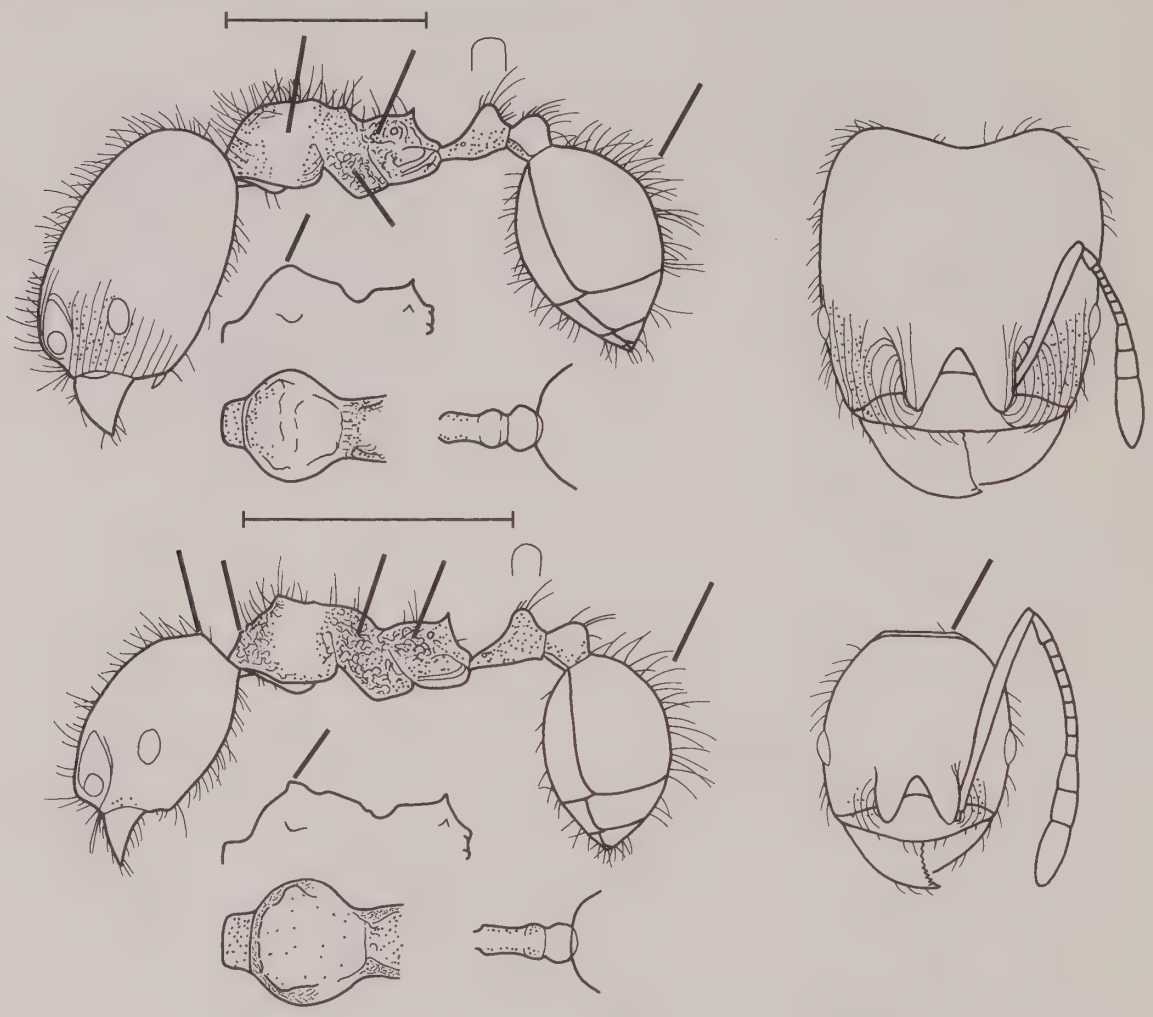


Pheidole perkinsi **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the collector and entomologist Philip D. Perkins.
DIAGNOSIS Similar in various traits to *albipes, ceibana, lemnisca, peltastes, renae, tayrona,* and *xyston,* differing as follows.
Major: blackish brown body contrasts with pale yellow legs; shallow antennal scrobe present; on dorsal head surface, carinulae and rugulae covering anterior three-fourths of head give way to band of irregular rugoreticulum just in advance of occiput, which gives way in turn to the smooth occiput; eye narrow, placed far forward on head; humeri and metanotum rugoreticulate; postpetiole elliptical.
Minor: eye very large, set forward on the head so that it is separated from the anterior head margin by only about a Head Length; humerus denticulate; propodeal spine equilaterally triangular.
MEASUREMENTS (mm) Holotype major: HW 0.76, HL 0.80, SL 0.48, EL 0.08, PW 0.42.
Paratype minor: HW 0.40, HL 0.44, SL 0.42, EL 0.08, PW 0.22.
COLOR Major: body blackish brown except for genae, which are contrasting reddish yellow; mandibles reddish brown; other appendages pale yellow.
Minor: body blackish brown, appendages pale yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *erratilis,* and other species listed in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Rio Peñas, Blancas Valley, Alajuela, 10°30′N 84°75′W, 940 m (J. T. Longino). Scale bars = 1 mm.



Pheidole petersoni **new species**

TYPES INBio.

ETYMOLOGY Named in honor of the great naturalist and artist Roger Tory Peterson, whose field-guide style inspired the form of the drawings used in this monograph.

DIAGNOSIS A very distinctive large member of the *flavens* group distinguished by its unique sculpturing.

Major: brown; mesopleuron and side of propodeum irregularly rugoreticulate; center and sides of pronotum smooth and shiny or at most with scattered punctures; humerus in dorsal-oblique view raised prominently.

Minor: yellow; mesopleuron and side of propodeum irregularly rugoreticulate; center and sides of pronotum smooth and shiny or at most with scattered punctures; humerus in dorsal-oblique view a pointed, "sharkfin" shape; occiput narrow surmounted by a thin collar. Similar in body form to *erratilis* of Costa Rica, which species lacks the rugoreticulum, has longer pilosity, and more extensive cephalic carinulae. See also the less similar *angulifera, ecuadorana, polita* (in the *tristis* group), *schmalzi,* and *styrax*.

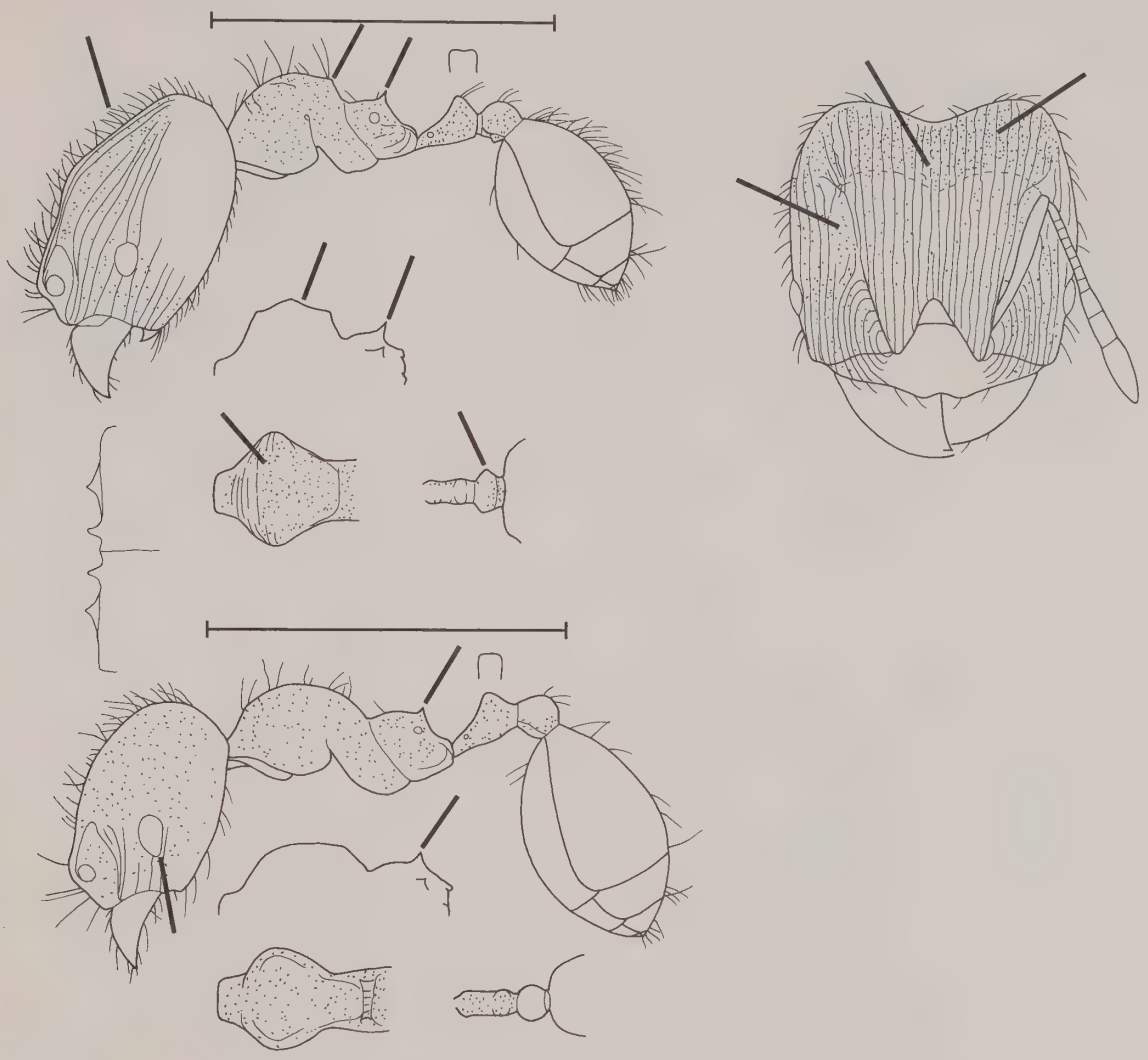
MEASUREMENTS (mm) Holotype major: HW 1.08, HL 1.14, SL 0.64, EL 0.18, PW 0.58.
Paratype minor: HW 0.60, HL 0.66, SL 0.66, EL 0.14, PW 0.40.

COLOR Major: medium to dark and slightly reddish brown, tarsi light yellowish brown.
Minor: medium brown, tarsi brownish yellow.

RANGE Known only from the type locality.

BIOLOGY New second-growth forest, on bananas and *Piper*; a colony was found nesting in a dead *Piper* stem (Longino 1997).

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios (Stefan Cover and John E. Tobin). Scale bars = 1 mm.



Pheidole pholeops **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *pholeops,* like a hole, or cavity, referring to illusion of a small hole in vertex.

DIAGNOSIS Similar to the species listed in the heading above, differing as follows.

Major: a small depression in the posterior center of the vertex gives an illusion of a hole; posterior dorsal profile of head very feebly concave; promesonotum raised, with two pronotal and one angular mesonotal convexity in dorsal-oblique view; postpetiole diamond-shaped; faint antennal scrobes present; almost all of dorsal surface of head carinulate and foveolate; all of mesosoma foveolate, and anterior third of pronotum carinulate.

Minor: eye large and set forward on head; propodeal spines reduced to denticles; all of dorsal surface of head and mesosoma foveolate.

MEASUREMENTS (mm) Holotype major: HW 0.70, HL 0.76, SL 0.40, EL 0.12, PW 0.34.
Paratype minor: HW 0.34, HL 0.36, SL 0.32, EL 0.08, PW 0.22.

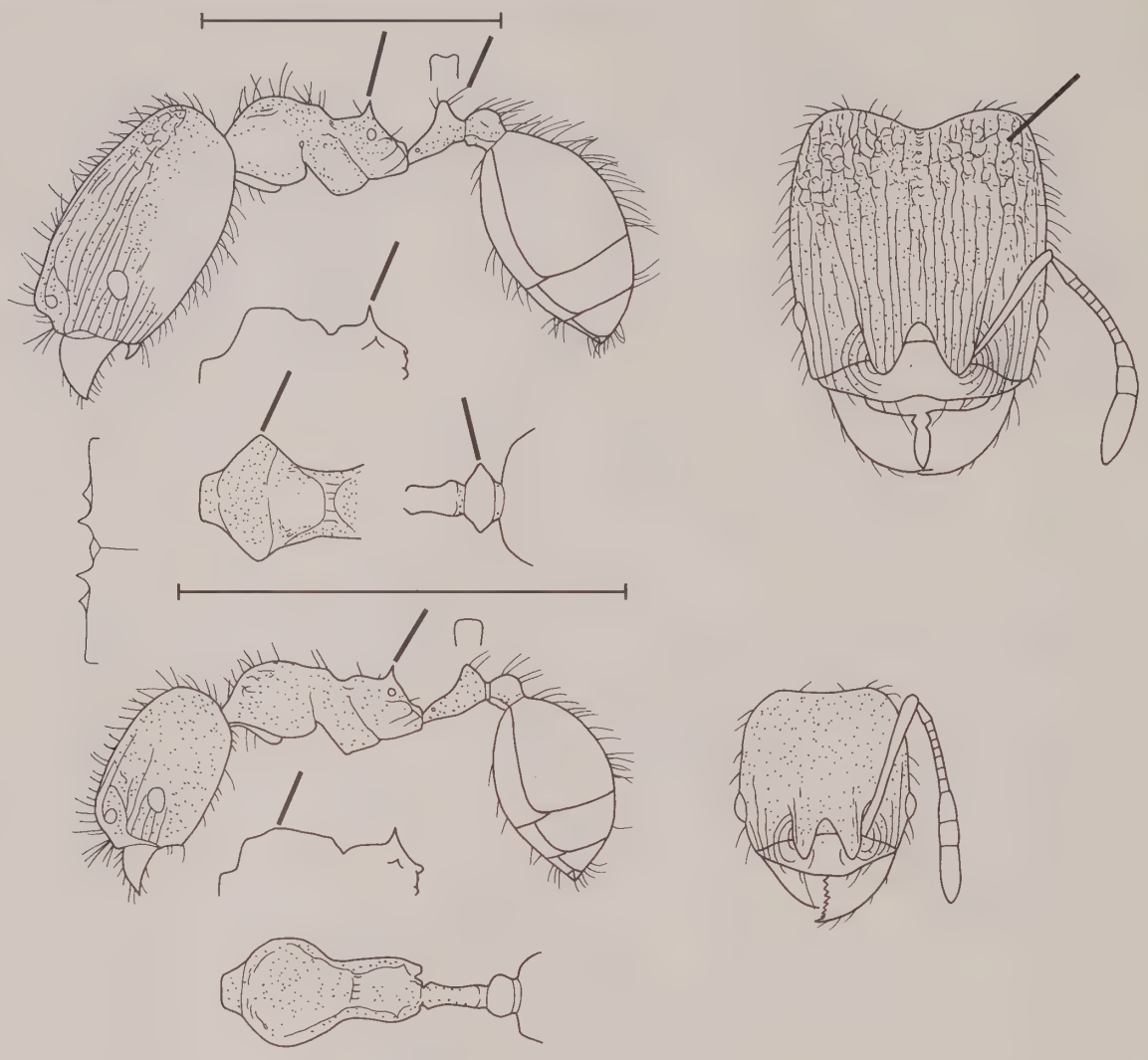
COLOR Major: body light brownish yellow ("bronze"), appendages clear medium yellow.

RANGE Known from the type locality; from the vicinity of Manaus, Amazonas, Brazil; and from Yasuni National Park, Puerto Tipugini, Ecuador.

BIOLOGY Cover and Tobin collected several colonies at the type locality (Cuzco Amazónico, Peru) in terra firme forest and forest transitional between terra firme and seasonally flooded forest, nesting in rotting sticks and logs on the forest floor and (in one case) in the soil.

Compare with *longinoi, otisi,*
also *ceibana, ruida, sospes*

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: Estación Biológica Los Tuxtlas, 10 km north-northwest of Sontecomapan, 18°35′N 95°05′W, 200 m (Philip S. Ward). Scale bars = 1 mm.



Pheidole prolixa **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *prolixa,* stretched out, referring to the somewhat elongate head of the major.

DIAGNOSIS A small, reddish (**major**) or yellowish brown (**minor**) species similar to *longinoi* and *otisi,* but readily distinguished by its darker color in both castes; the erect propodeal spine in both castes; and the more extensive cephalic sculpturing in the **major**, in which the frontal lobes are completely carinulate, and carinulae mesad to the eye extend all the way from the anterior clypeal border to the rugoreticulum that covers the occiput. *P. prolixa* has somewhat less resemblance to *ceibana, ruida,* and *sospes,* which may be examined to confirm the identification.

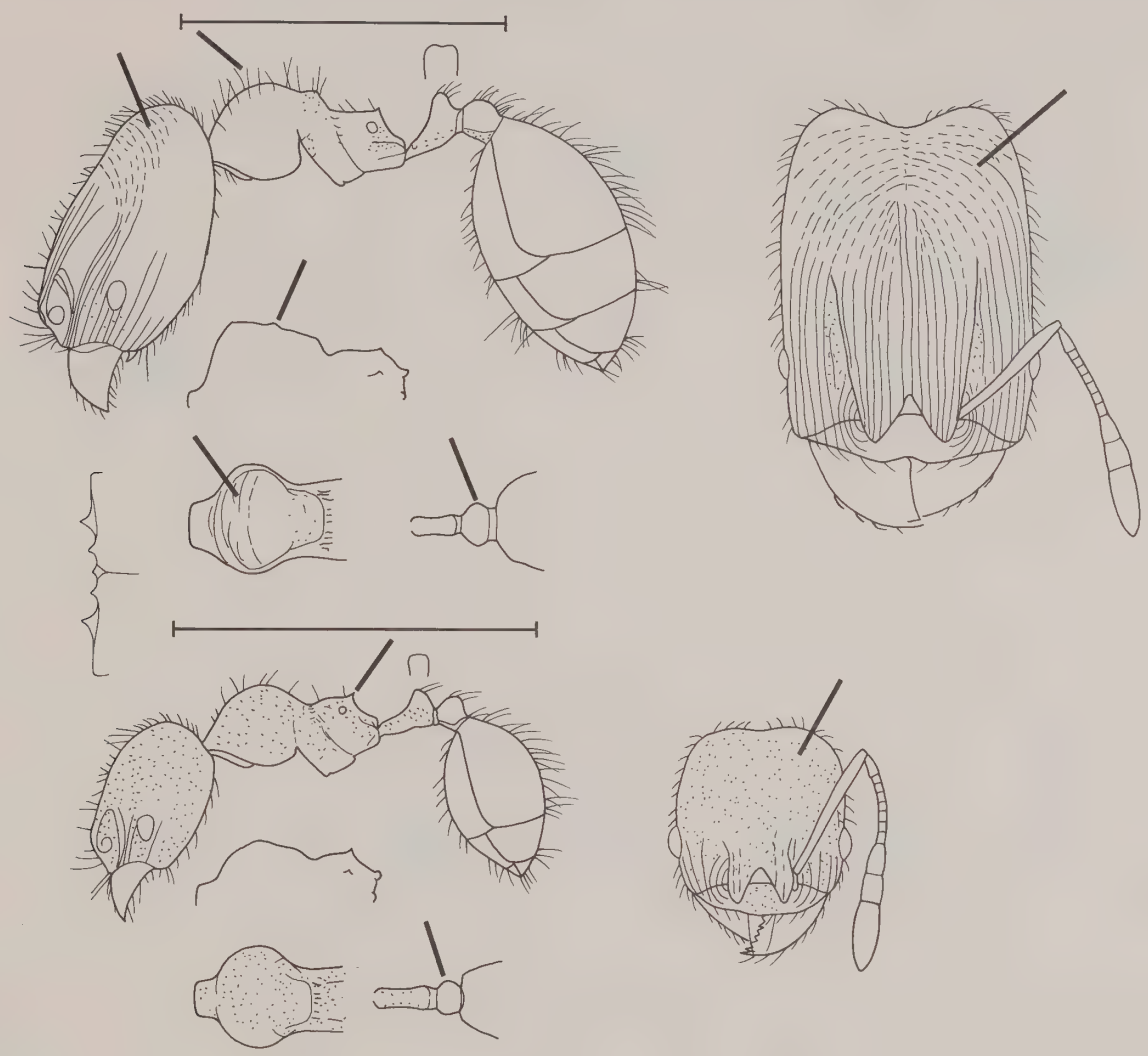
MEASUREMENTS (mm) Holotype major: HW 0.72, HL 0.84, SL 0.40, EL 0.10, PW 0.38.
Paratype minor: HW 0.40, HL 0.46, SL 0.36, EL 0.06, PW 0.26.

COLOR Major: body light reddish brown, appendages dark yellow.
Minor: body yellowish brown, appendages clear medium yellow.

RANGE Known from the type series only.

BIOLOGY The type series was sifted from litter and mold on the floor of lowland rainforest.

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: Las Hamacas, 17 km north of Santiago Tuxtla, Veracruz (E. O. Wilson). Scale bars = 1 mm.



Pheidole protensa **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *protensa,* stretched out, referring to the somewhat elongate head of the major.

DIAGNOSIS A very small, yellow member of the *flavens* group, distinguished in the **major** by an elongated head entirely covered dorsally with longitudinal carinulae, which grow faint and curve inwardly in the posterior third of the head to converge toward and meet at the midline, becoming horizontal near the occiput.

Major: also with broken transverse carinulae on pronotal dorsum; a small but distinct mesonotal convexity; propodeal spines reduced to denticles; and a large propodeal spiracle.

Minor: all of head and mesosoma foveolate and opaque; propodeal spines reduced to denticles.

Similar to *browni, casta, mera, olsoni,* and *prolixa,* but easily distinguished by the above traits.

MEASUREMENTS (mm) Holotype major: HW 0.60, HL 0.82, SL 0.34, EL 0.10, PW 0.32.
Paratype minor: HW 0.38, HL 0.44, SL 0.34, EL 0.06, PW 0.36.

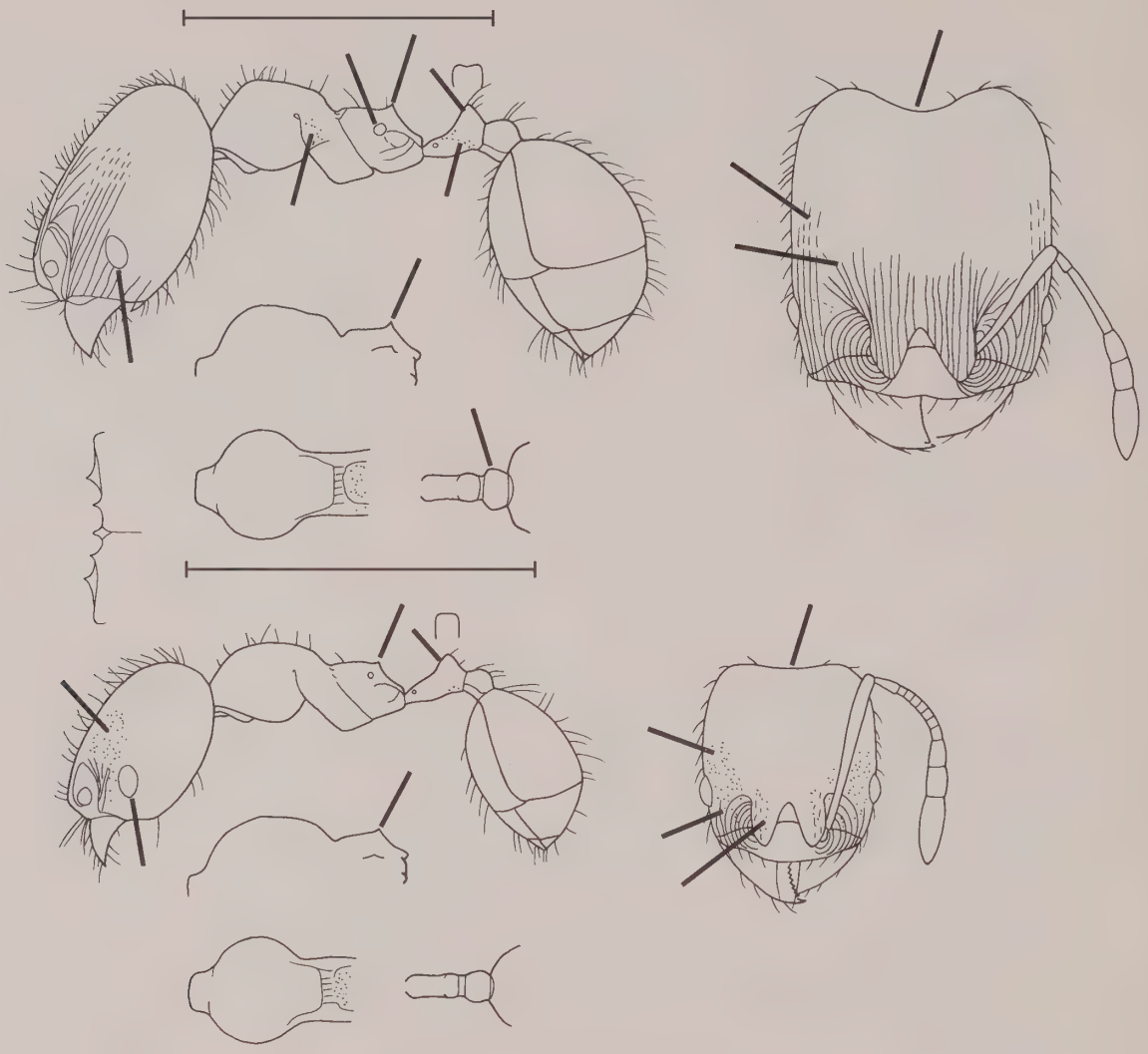
COLOR Major and minor concolorous medium yellow.

RANGE Known from the type series; from near Cuichapa, Veracruz, 1600 m; and from Tuli Creek, near San Miguel, Nicaragua.

BIOLOGY In Veracruz, *protensa* has been found in both lowland rainforest and in montane *cafetals,* i.e., forest with coffee.

Compare with *christopherseni, exquisita, nigricula, nitella, olsoni, protensa, sagittaria*

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: TV Tower Road, Saldido, west of Cali, Valle, 1900–2100 m (W. L. Brown and R. B. Root). Scale bars = 1 mm.



Pheidole pygmaea **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *pygmaea,* dwarf.

DIAGNOSIS Similar to the species listed in the heading above, differing as follows.

Major: yellow; eye large, oval, set far forward on head; head elongate; occipital cleft broad, deep, its nadir semicircular; propodeal spines reduced to right angles; propodeal spiracle large, as wide as base of spines; petiolar node tapers to a point; carinulae mesad to eyes extend almost halfway to occipital lobes; carinulae originating at rear of frontal lobes spread laterally, away from the midline; small patches of foveolae present on mesopleuron and petiolar peduncle, and mesosoma, waist, and gaster otherwise smooth and shiny.

Minor: eye very large, set far forward, tapered slightly toward anterior end; anterior half of head partly carinulate and foveolate, and entire remainder of head and body smooth and shiny.

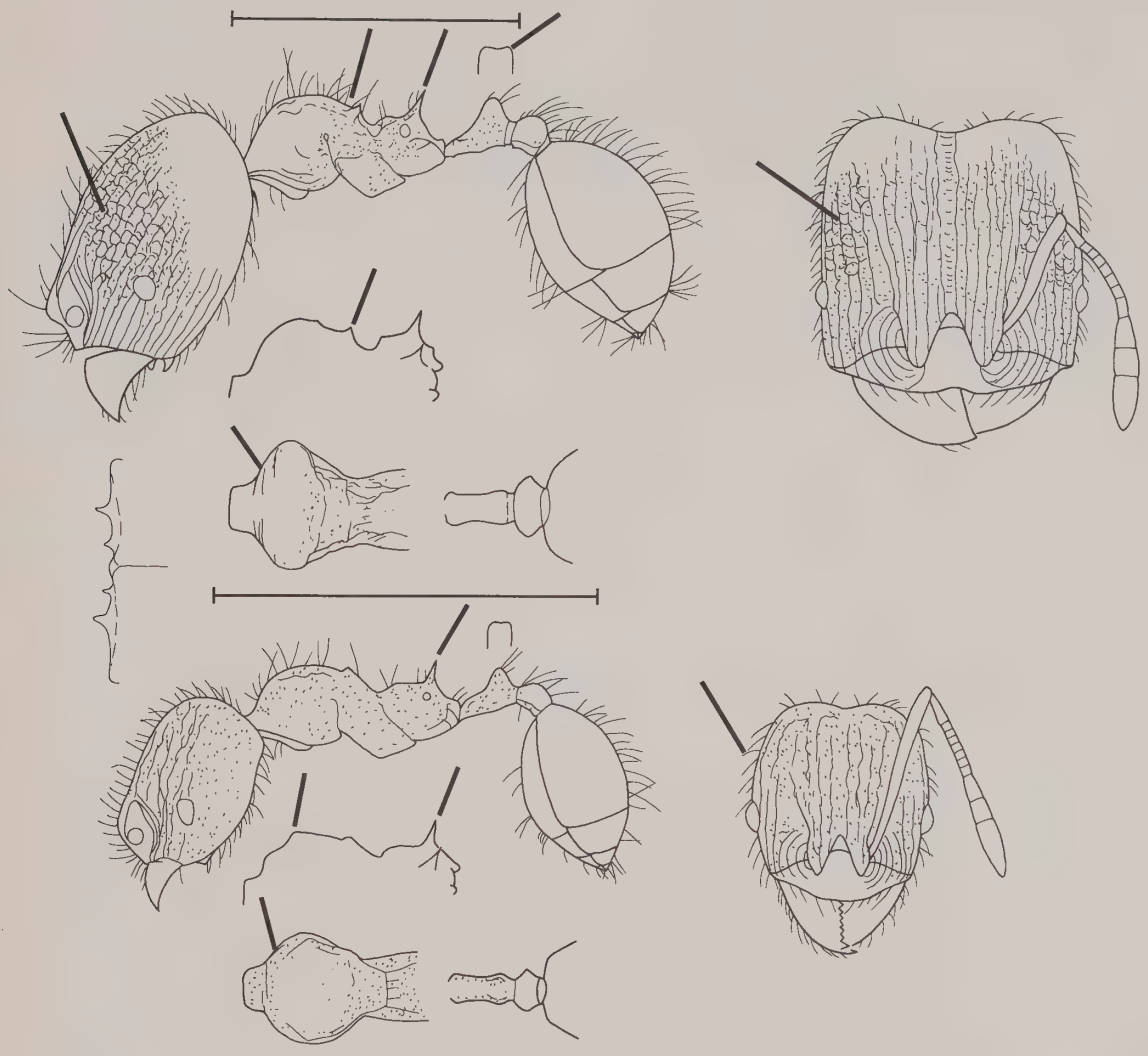
MEASUREMENTS (mm) Holotype major: HW 0.74, HL 0.90, SL 0.40, EL 0.10, PW 0.40.
Paratype minor: HW 0.44, HL 0.50, SL 0.40, EL 0.08, PW 0.26.

COLOR Major: body dark yellow, appendages medium yellow.
Minor: concolorous medium yellow.

RANGE Known from the type locality and from localities in Chocó and Cundinamarca, Colombia.

BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Providencia Biological Station, Zona Buenos Aries, Antioquia, 600–800 m (Charles Kugler). Scale bars = 1 mm.

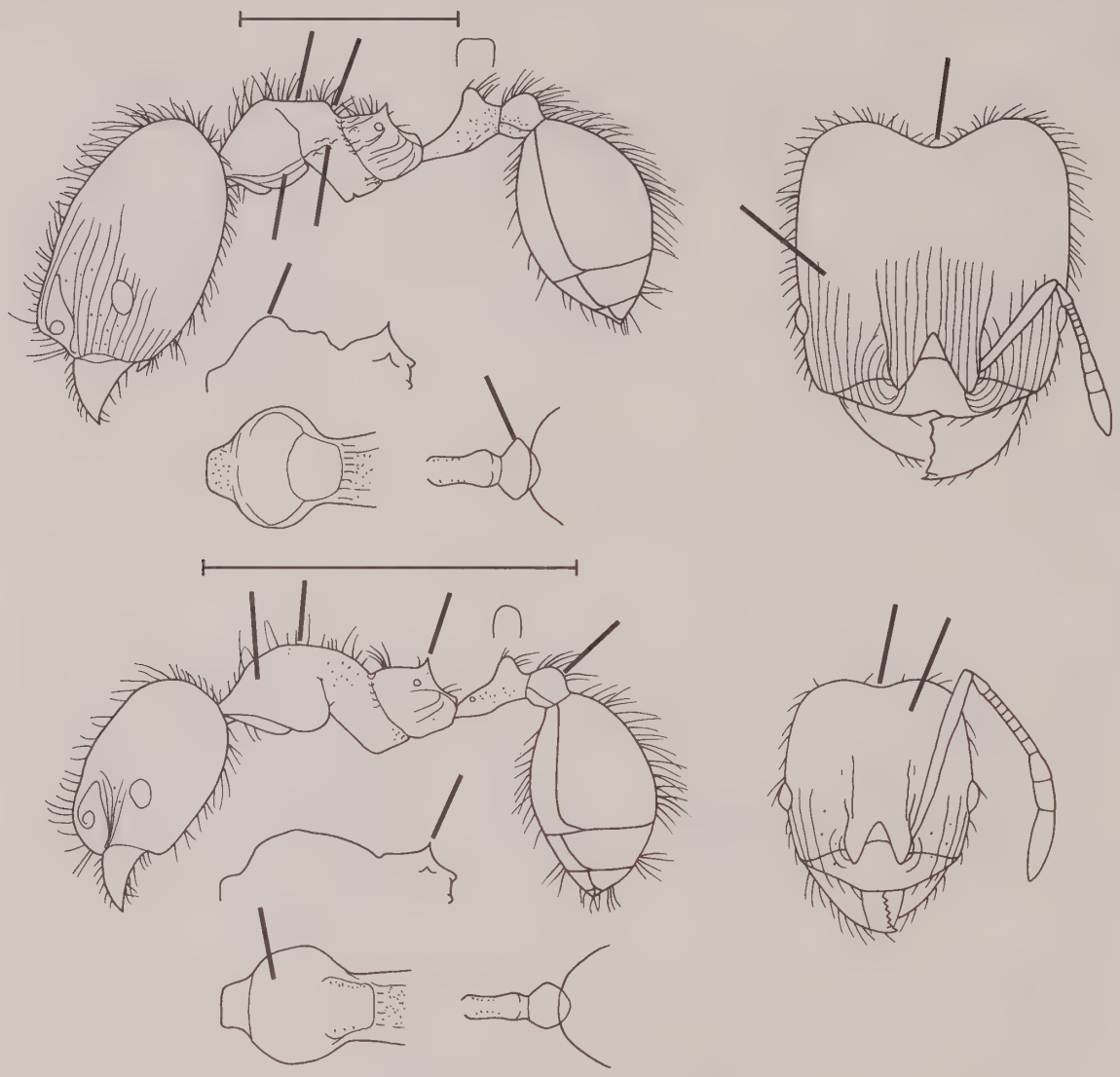


Pheidole quadriceps **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *quadriceps,* square-headed, referring to head shape in frontal view.
DIAGNOSIS A medium-sized, yellow member of the *flavens* group whose **major** is distinguished by its square head shape in full-face view, angulate profile of the mesonotal convexity, and large propodeal spines.
Similar to *carinata* of montane Costa Rica but differs in the **major** by its much longer propodeal spine, more extensive sculpturing on the head, lack of a rugoreticulum on the mesosoma, and color; and in the minor by the absence anywhere of rugoreticula; and by color.
See also the less similar *kuna, obtusopilosa, rectisentis, scabriventris,* and *termitobia*.
MEASUREMENTS (mm) Holotype major: HW 0.90, HL 0.92, SL 0.46, EL 0.08, PW 0.44.
Paratype minor: HW 0.44, HL 0.50, SL 0.42, EL 0.06, PW 0.28.
COLOR Major: body light brownish yellow, mandibles dark brownish yellow.
Minor: concolorous medium yellow.
RANGE Known only from the type locality.
BIOLOGY Collected in second-growth forest.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: vicinity of Omilteme, Guerrero, 2300–2500 m (Cornell University Field Party, 1965). Scale bars = 1 mm.



Pheidole quercicola **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *quercicola,* oak-dwelling, allusion to habitat of type colony.

DIAGNOSIS Similar in various traits to *bilimeki, chalca, daphne, floridana, furtiva, nebulosa, specularis,* and *stomachosa,* differing as follows.

Major: yellow; profile of promesonotal dorsum flat in side view, descending to metanotum in steep posterior face; humerus discrete and lobose in dorsal-oblique view; occiput broad and deeply concave; postpetiole conate from above; posterior half of head smooth and shiny; and anterior half of dorsal surface of head carinulate; lower margin of pronotum carinulate; middle of mesopleuron with band of broken rugulae.

Minor: occiput broad, strongly concave; promesonotal profile semicircular; propodeal spine equilaterally triangular; postpetiolar node strongly developed in side view; almost all of body smooth and shiny.

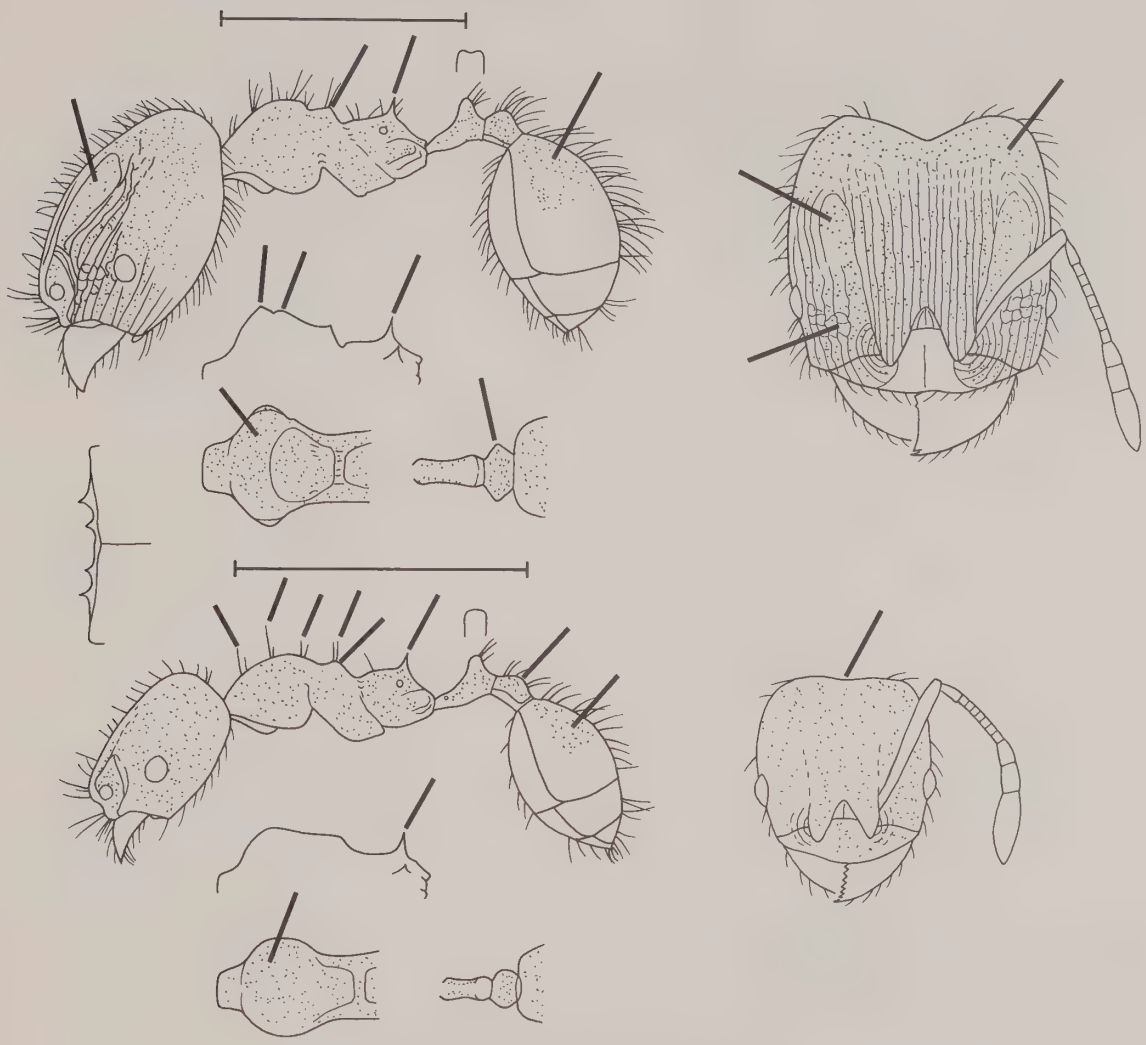
MEASUREMENTS (mm) Holotype major: HW 1.06, HL 1.12, SL 0.50, EL 0.14, PW 0.54.
Paratype minor: HW 0.52, HL 0.58, SL 0.48, EL 0.08, PW 0.34.

COLOR Major: concolorous medium yellow.
Minor: concolorous light yellow.

RANGE Known only from the type locality.

BIOLOGY The type colony was collected at a relatively high elevation in humid pine-oak forest.

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: Rancho del Cielo, Sierra de Guatemala, Tamaulipas, 1070 m (Cornell University Field Party, 1965). Scale bars = 1 mm.

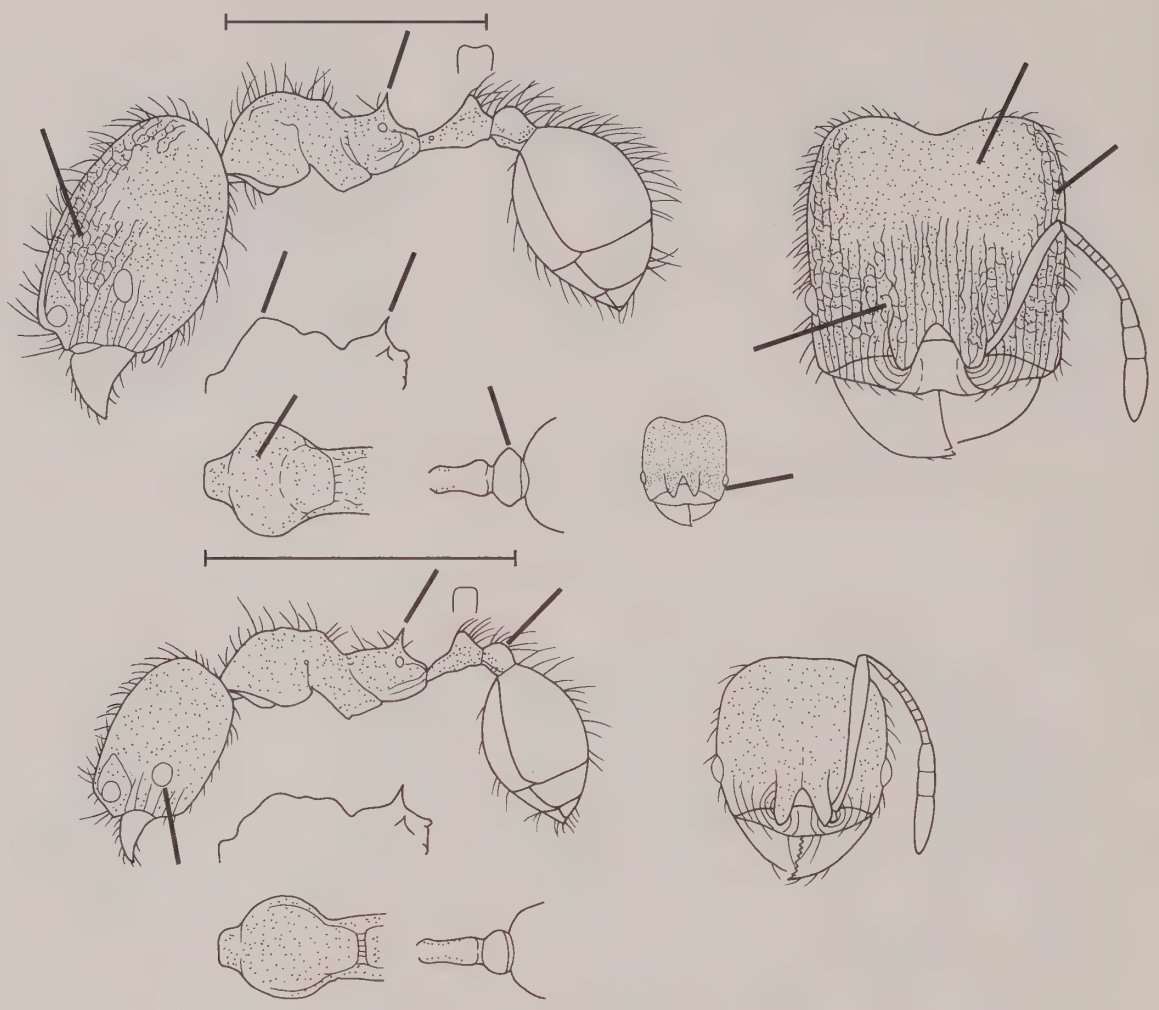


Pheidole rectiluma **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *rectiluma,* upright thorn, referring to the propodeal spine.
DIAGNOSIS Similar in various traits to the *bilimeki, floridana, hazenae, rectisentis, rectispina, rectitrudis, sospes,* and *stomachosa,* differing as follows.
Major: shallow antennal scrobe present; mesonotal convexity well developed, and angulate in dorsal-oblique view; propodeal spines almost half as long as propodeal basal face and nearly vertical to it; pronotum in dorsal-oblique view weakly bilobate; postpetiole from above diamond-shaped; dorsal surface of head and all of mesosoma foveolate and opaque; anterior half of central strip of first gastral tergite shagreened.
Minor: head quadrate in side view; occiput broad and weakly concave; propodeal spines vertical to propodeal basal face; postpetiolar node in side view suppressed; all of head and mesosoma foveolate and opaque; anterior half of central strip of first gastral tergite shagreened.
MEASUREMENTS (mm) Holotype major: HW 0.94, HL 1.00, SL 0.50, EL 0.12, PW 0.44.
Paratype minor: HW 0.48, HL 0.54, SL 0.42, EL 0.08, PW 0.30.
COLOR Major: concolorous light brown.
Minor: concolorous medium brown.
RANGE Known only from the type locality.
BIOLOGY The type colony was collected in tall cloud forest.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. NICARAGUA: Hotel Selva Negra, 139 km north of Matagalpa, 1200 m (Charles Kugler and J. Hahn). Scale bars = 1 mm.



Pheidole rectisentis **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *rectisentis,* upright thorn, alluding to the strong, erect propodeal spines.

DIAGNOSIS Similar to *bilimeki, floridana, hazenae, rectiluma, rectispina, rectitrudis, sospes,* and *stomachosa,* differing as follows.

Major: mostly blackish brown, with bicolored head; from margins of dorsal head surface to space between eyes and antennal fossae rugoreticulate, as well as lateral margins of frontal lobes; all of central third of head, including much of the vertex and occiput, solely foveolate; all of head and mesosoma overall foveolate; in dorsal-oblique view humerus subangulate; propodeal spines robust and nearly vertical to propodeal basal face in side view; postpetiole from above conulate.

Minor: eyes set well forward on head; propodeal spines robust, nearly vertical to propodeal basal face; almost all of head and all of mesosoma foveolate and opaque.

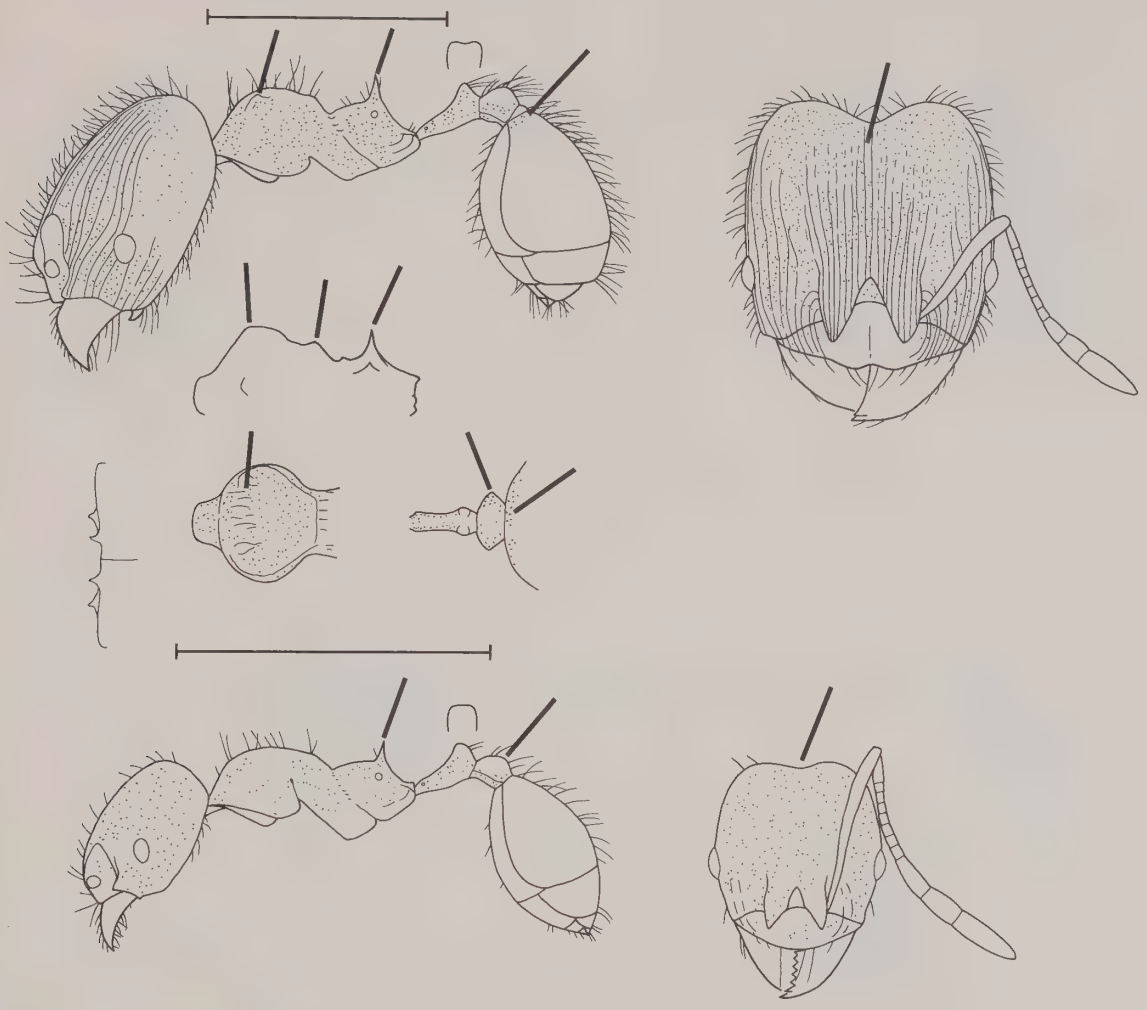
MEASUREMENTS (mm) Holotype major: HW 0.90, HL 0.98, SL 0.50, EL 0.12, PW 0.48.
Paratype minor: HW 0.50, HL 0.58, SL 0.46, EL 0.06, PW 0.34.

COLOR Major: head bicolored, with surface anterior to eye level medium reddish brown and rest blackish brown; also sides of pronotum and petiole medium reddish brown; and rest of body blackish brown; appendages light reddish brown.
Minor: body blackish brown, appendages brownish yellow.

RANGE Known only from the type locality.

BIOLOGY The type colony was found in forest, nesting in a rotting twig in leaf litter in a tree crotch about one meter from the ground.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (E. O. Wilson). Scale bars = 1 mm.

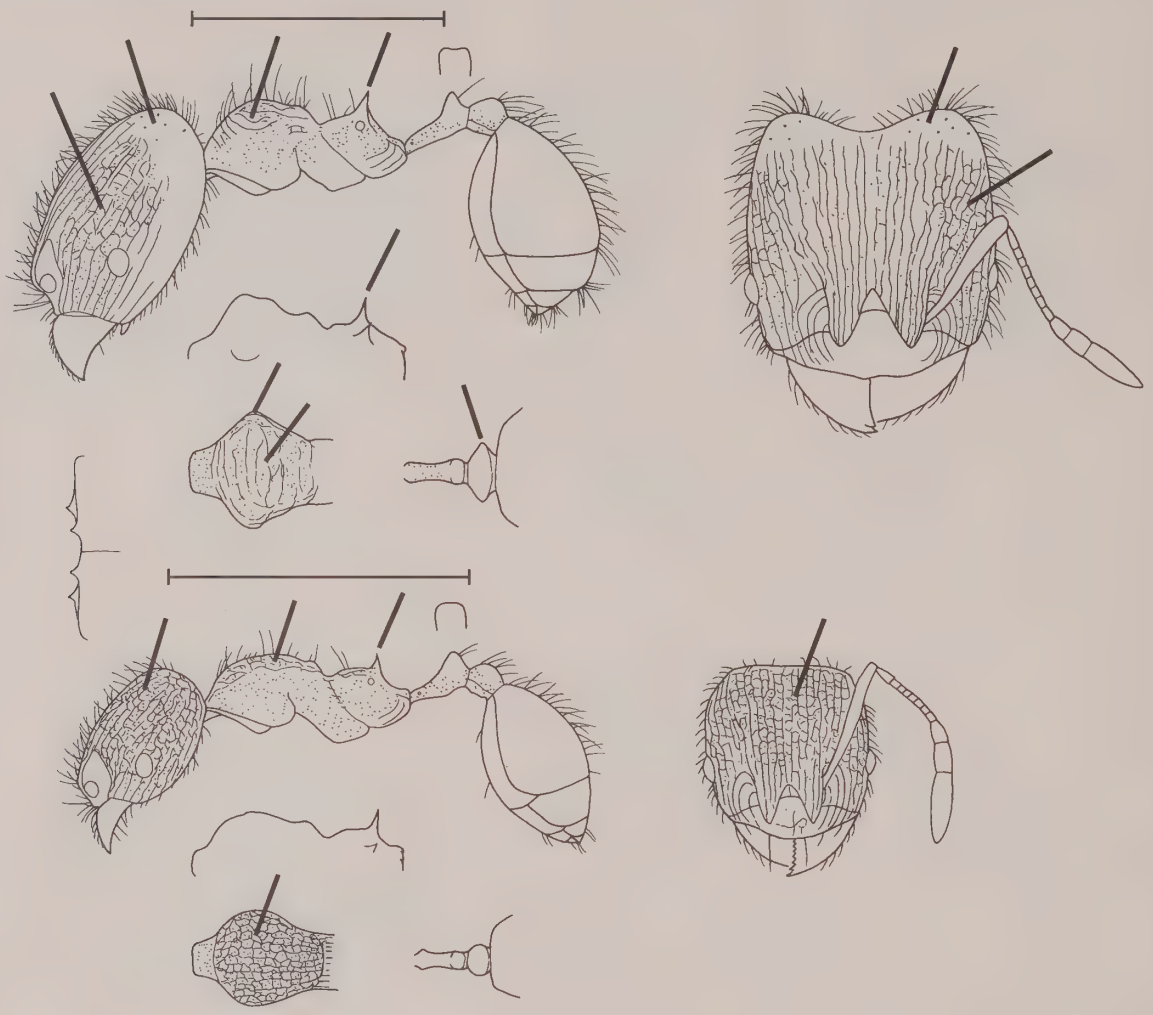


Pheidole rectispina **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *rectispina,* upright spine.
DIAGNOSIS Similar in various traits to *bilimeki, floridana, hazenae, rectiluma, rectisentis, rectitrudis, sospes,* and *stomachosa,* differing as follows.
Major: propodeal spine half as long as propodeal basal face and perpendicular to it; humeri low and subangulate; mesonotal convexity present; postpetiole from above elliptical, with angulate lateral margins; all of dorsal surface of head except occipital lobes, frontal triangle, and midclypeus carinulate; all of mesosoma and most of head and waist foveolate and opaque; anterior fringe of first gastral tergite shagreened.
Minor: propodeal spine half as long as the propodeal face and vertical on it; postpetiolar node somewhat depressed; occiput broad, its margin concave; all of head and mesosoma foveolate and opaque, no rugoreticulum and almost no carinulae.
MEASUREMENTS (mm) Holotype major: HW 1.00, HL 1.14, SL 0.56, EL 0.14, PW 0.50.
Paratype minor: HW 0.44, HL 0.50, SL 0.46, EL 0.08, PW 0.30.
COLOR Major: dark, even blackish brown.
Minor: body medium brown, appendages yellowish brown.
RANGE Atlantic slope of Costa Rica from lowlands to montane forest (Longino 1997); and Belize (Hummingbird Gap, near Stann; Stewart Peck).
BIOLOGY Occurs on the floor of primary rainforest.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo (Stefan Cover). Scale bars = 1 mm.



Pheidole rectitrudis **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *rectitrudis,* erect pike or pointed pole, alluding to propodeal spines.

DIAGNOSIS Similar to *bilimeki, floridana, hazenae, rectiluma, rectisentis, rectispina, sospes,* and *stomachosa,* differing as follows.

Major: propodeal spines robust, half as long as propodeal basal face, vertical to propodeum; frontal lobes, vertex, and dorsal midline strip to occiput carinulate and rugulose; occipital lobes smooth with scattered foveae; sides of head rugoreticulate; humeri longitudinally rugulose, and promesonotal dorsum transversely carinulate; postpetiole from above conulate.

Minor: all of dorsal surface of head from eye level to occiput rugoreticulate, as well as all of promesonotal dorsum; propodeal spines long, robust, and vertical to propodeal basal face.

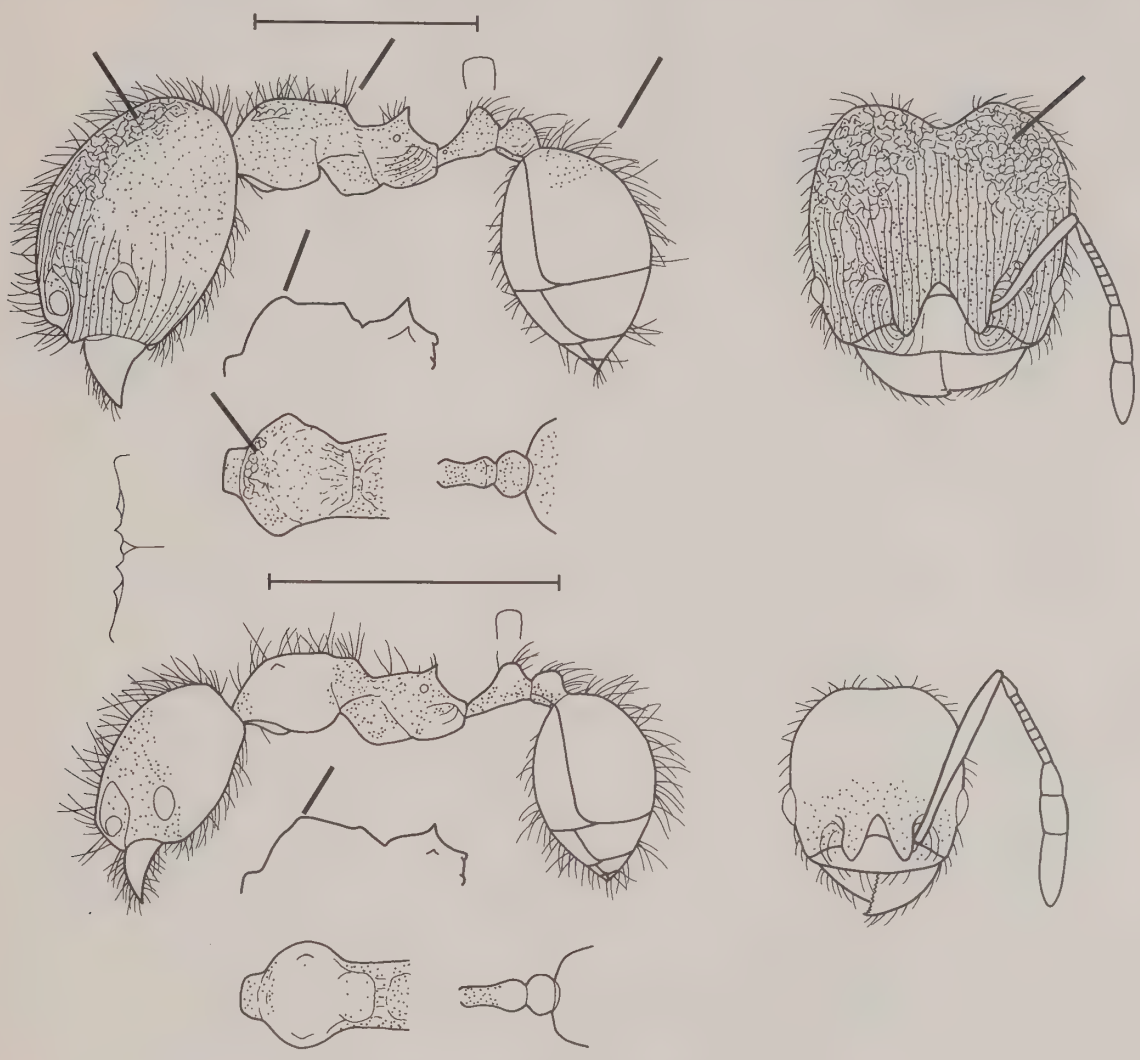
MEASUREMENTS (mm) Holotype major: HW 0.90, HL 0.98, SL 0.48, EL 0.12, PW 0.48.
Paratype minor: HW 0.50, HL 0.54, SL 0.44, EL 0.08, PW 0.32.

COLOR Major: body, scape, and mandibles dark, almost blackish brown; legs and funiculus medium brown.
Minor: head, mesosoma, petiole, and appendages medium brown; postpetiole and gaster dark brown.

RANGE Known from the type locality and from Peñas Blancas Valley, Costa Rica (J. T. Longino 1997); and near San Andres Tuxtla (1500 m) and Orizaba (1600 m), Mexico (P. S. Ward).

BIOLOGY Evidently uncommon. The type colony was collected by Stefan Cover in the soil of lowland rainforest beneath a log. The Mexican colonies were found in cloud forest.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Rio Peñas Blancas, Prov. Alajuela, 10°19′N 84°34′W, 800 m (J. T. Longino). Scale bars = 1 mm.

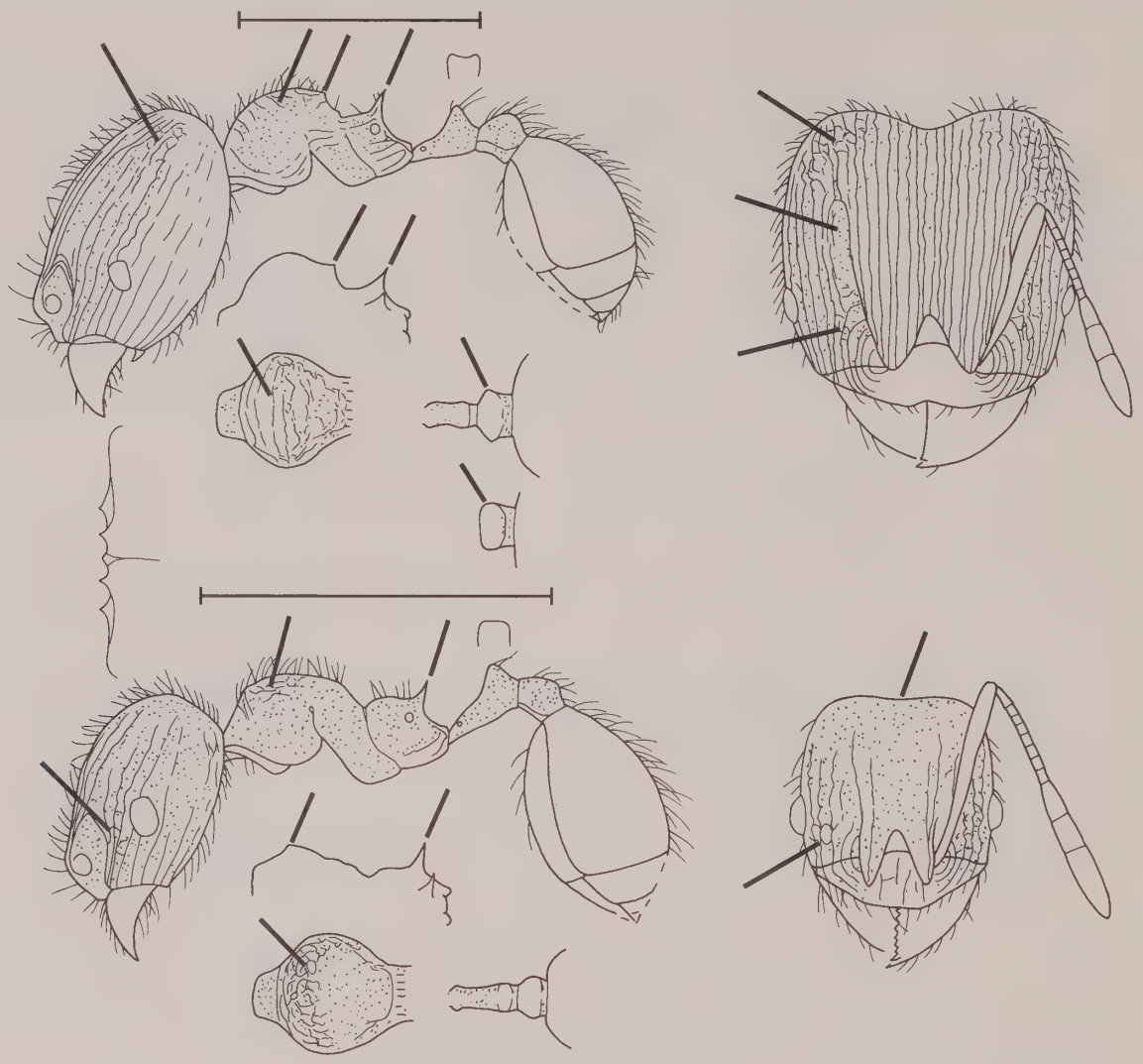


Pheidole renae **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY In honor of my wife and helper Irene (Renee) Wilson.
DIAGNOSIS A distinctive member of the *flavens* group, separable in the **major**, by the rugoreticulate occiput and anterior pronotal dorsum, cornulate humerus, steep descent of the posterior mesonotum in profile to the metanotum, and shagreened anterior half of the first gastral tergite. The **minor** has an obtusely angular humerus in dorsal-oblique view and steep descent of the posterior mesonotal profile. Similar to *geminata* and *lemnisca*.
MEASUREMENTS (mm) Holotype major: HW 1.12, HL 1.12, SL 0.62, EL 0.18, PW 0.54.
Paratype minor: HW 0.58, HL 0.60, SL 0.64, EL 0.12, PW 0.36.
COLOR Major: concolorous dark yellow.
Minor: concolorous medium yellow.
RANGE Mid-elevation Talamancas and Cordillera de Tilaran (Longino 1997).
BIOLOGY Leaf litter in wet forest (Longino 1997).

Compare with *exigua, glomericeps, moffetti, nana, styrax*; see note on *bucolica* in the Diagnosis below

FIGURE Upper: lectotype, major (second, lower outline of postpetiole dorsum is of synonymous *bucolica* holotype). Lower: paralectotype, minor. ARGENTINA: San Pedro, Misiones. Scale bars = 1 mm.



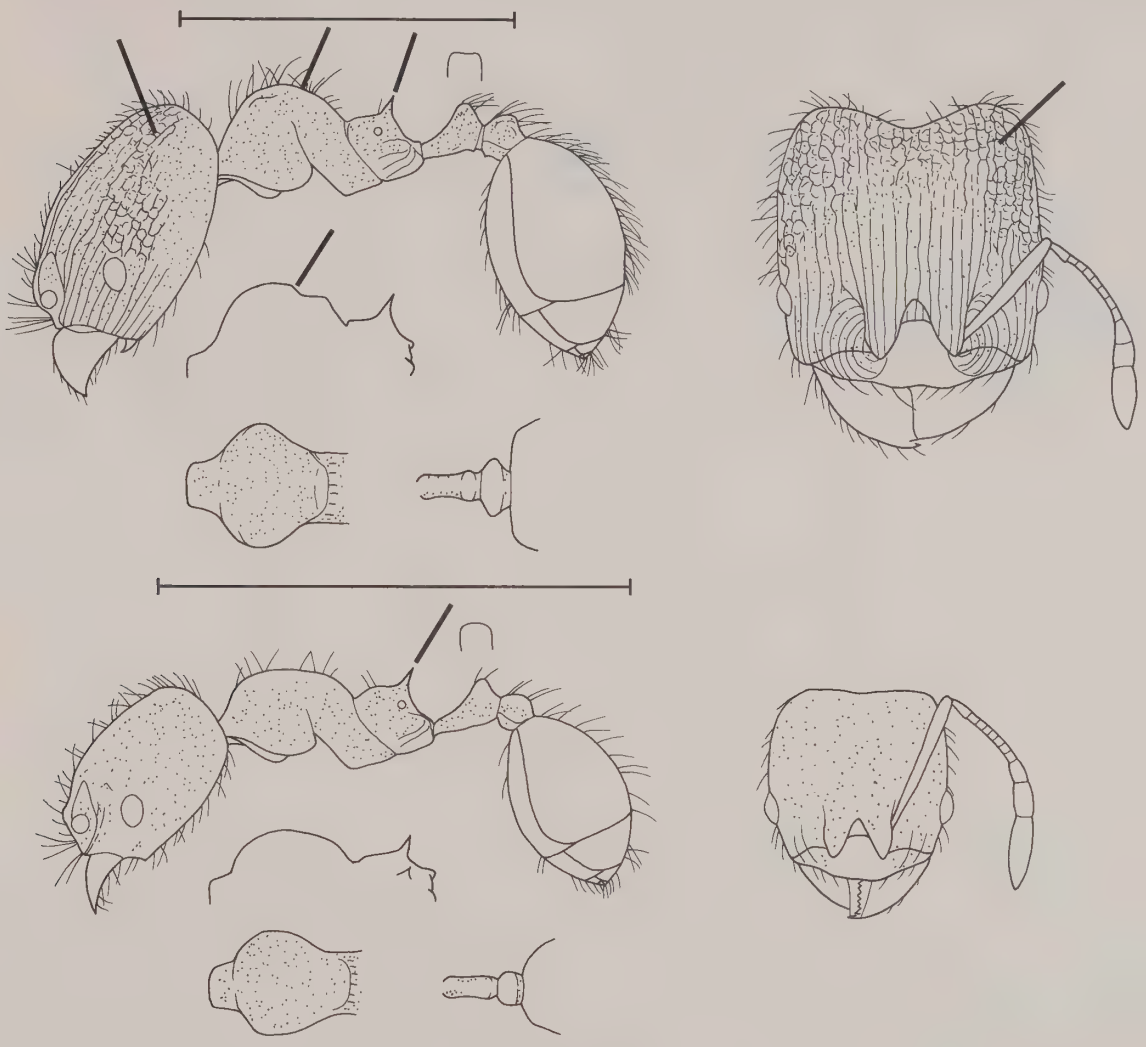
Pheidole rudigenis Emery, **new status**

Pheidole flavens subsp. *rudigenis* Emery 1906c: 155. Syn.: *Pheidole bucolica* Santschi 1929d: 289, n. syn. (provisional).

TYPES Mus. Civ. Stor. Nat. Genova.
ETYMOLOGY L *rudigenis,* rough cheek, referring to sculpturing of head.
DIAGNOSIS Similar to species listed in heading above, differing as follows.
Major: shallow antennal scrobes present; occipital lobes and humeri rugoreticulate; dorsal surfaces of head and pronotum otherwise carinulate; dorsal promesonotal profile elevated, strongly convex, mesonotal convexity subangulate; propodeal spines half the length of the propodeal dorsal face; postpetiolar node from above diamond-shaped.
Minor: space between eye and antennal fossa, as well as anterior third of promesonotal dorsum, rugoreticulate; entire head and mesosoma foveolate and opaque; propodeal spines half as long as propodeal basal face; occiput broad and convex.
(The holotype of *bucolica,* placed in provisional synonymy, differs from the *rudigenis* lectotype in its oval postpetiole, as depicted, and more strongly rugulose genae; given its distant origin, in Pará, it may be a distinct species.)
MEASUREMENTS (mm) Lectotype major: HW 1.04, HL 1.02, SL 0.56, EL 0.14, PW 0.50.
Paralectotype minor: HW 0.54, HL 0.60, SL 0.52, EL 0.08, PW 0.36.
COLOR Major: head, mesosoma, and waist light reddish brown; gaster and antennae medium brownish yellow; legs light brownish yellow.
Minor: head and mesosoma medium yellowish brown; waist, gaster, and appendages light yellowish brown.
RANGE In addition to the types, I have seen a series from Itaúnas, Espirito Santo, southeastern Brazil. The holotype of synonymous *bucolica* is from Monte Alegre, Pará, in Amazonian Brazil, an anomalous record for the species.
BIOLOGY The Itaúnas series was collected by R. Paiva inside a nest of a giant ponerine ant, *Dinoponera* sp.; the relationship, if any, is unknown.

Compare with *ceibana,* and also the other species listed in the Diagnosis below

FIGURE Upper: holotype, major . Lower: paratype, minor. PANAMA: Barro Colorado Island (W. L. Brown and E. S. McCluskey). Scale bars = 1 mm.



Pheidole ruida **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *ruida,* rough, referring to the heavy sculpturing of the head.

DIAGNOSIS A small species, with medium to dark brown **major** and **minor**; **major** with completely sculptured cephalic dorsum, including rugoreticulate occiput, smoothly semicircular promesonotal profile, and relatively long propodeal spine. Similar to *ceibana* of Honduras but differing in many details of sculpture, including the completely foveolate head dorsum and promesonotum of the minor, and longer propodeal spine.

See also the somewhat less similar *harrisonfordi, lemnisca, peltastes, sospes, verricula,* and *xyston*.

MEASUREMENTS (mm) Holotype major: HW 0.74, HL 0.78, SL 0.36, EL 0.10, PW 0.38.

Paratype minor: HW 0.38, HL 0.42, SL 0.34, EL 0.06, PW 0.26.

COLOR Major: body medium to dark brown, appendages brownish yellow.

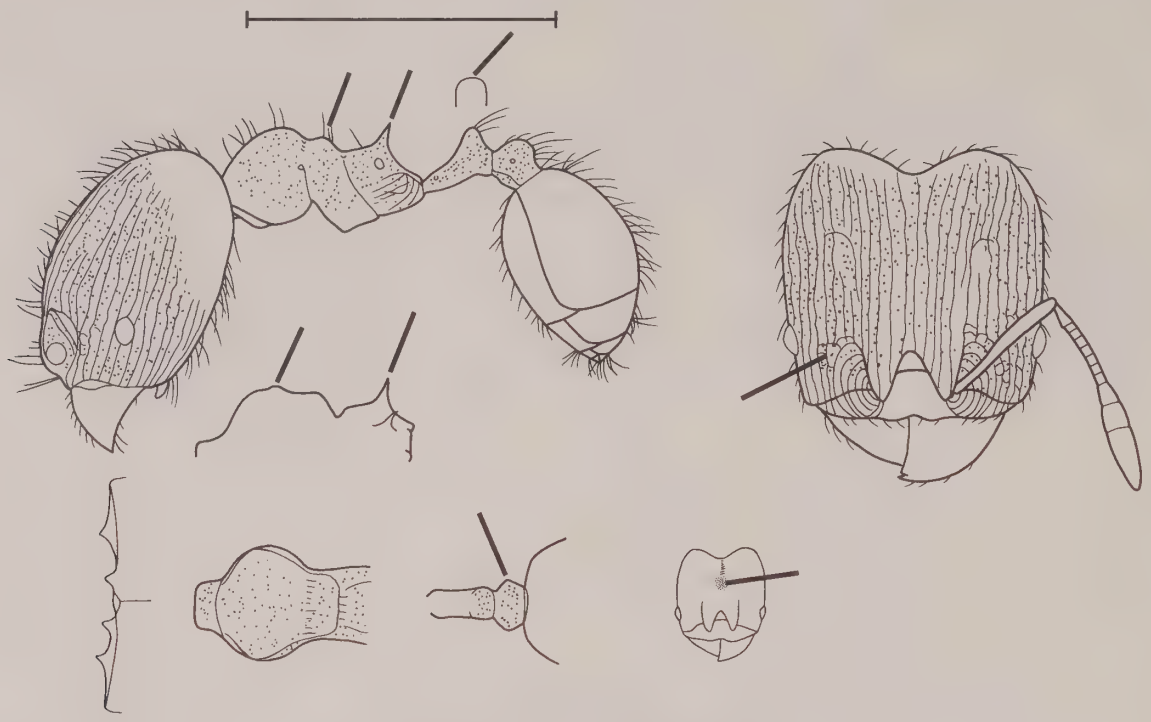
Minor: body medium brown, appendages brownish yellow.

RANGE Costa Rica and Panama.

BIOLOGY On Panama, in lowland tropical evergreen forest of Barro Colorado Island (W. L. Brown and E. L. McCluskey). In Costa Rica, both Atlantic and Pacific slopes up to 1600 m, in mature wet forest, including cloud forest at higher elevations, where it occurs in leaf litter on the forest floor and can be drawn to baits (J. T. Longino 1997).

Compare with *kuna*

FIGURE Holotype, major. PERU: near Lake Sandoval, Puerto Maldonado, Tambopata, 260 m (Charles Kugler and R. R. Lampert). Scale bar = 1 mm.



Pheidole sabella **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *sabella,* dim. of *sabulum,* sand, referring to the nest site.

DIAGNOSIS Known only from the major. A medium-sized reddish yellow member of the *flavens* group, most similar to *kuna* of Panama, including the possession of shallow antennal scrobes, a well-developed mesonotal convexity, and parallel longitudinal carinulae that extend over the entire dorsum of the head to near the occiput. Departs from *kuna* in the different shape of the mesonotal convexity in side view, the larger propodeal spines, the presence of a rugoreticulum mesad to the eyes, and a contrasting brown spot near the center of the head capsule.

MEASUREMENTS (mm) Holotype major: HW 0.86, HL 0.92, SL 0.44, EL 0.10, PW 0.42.

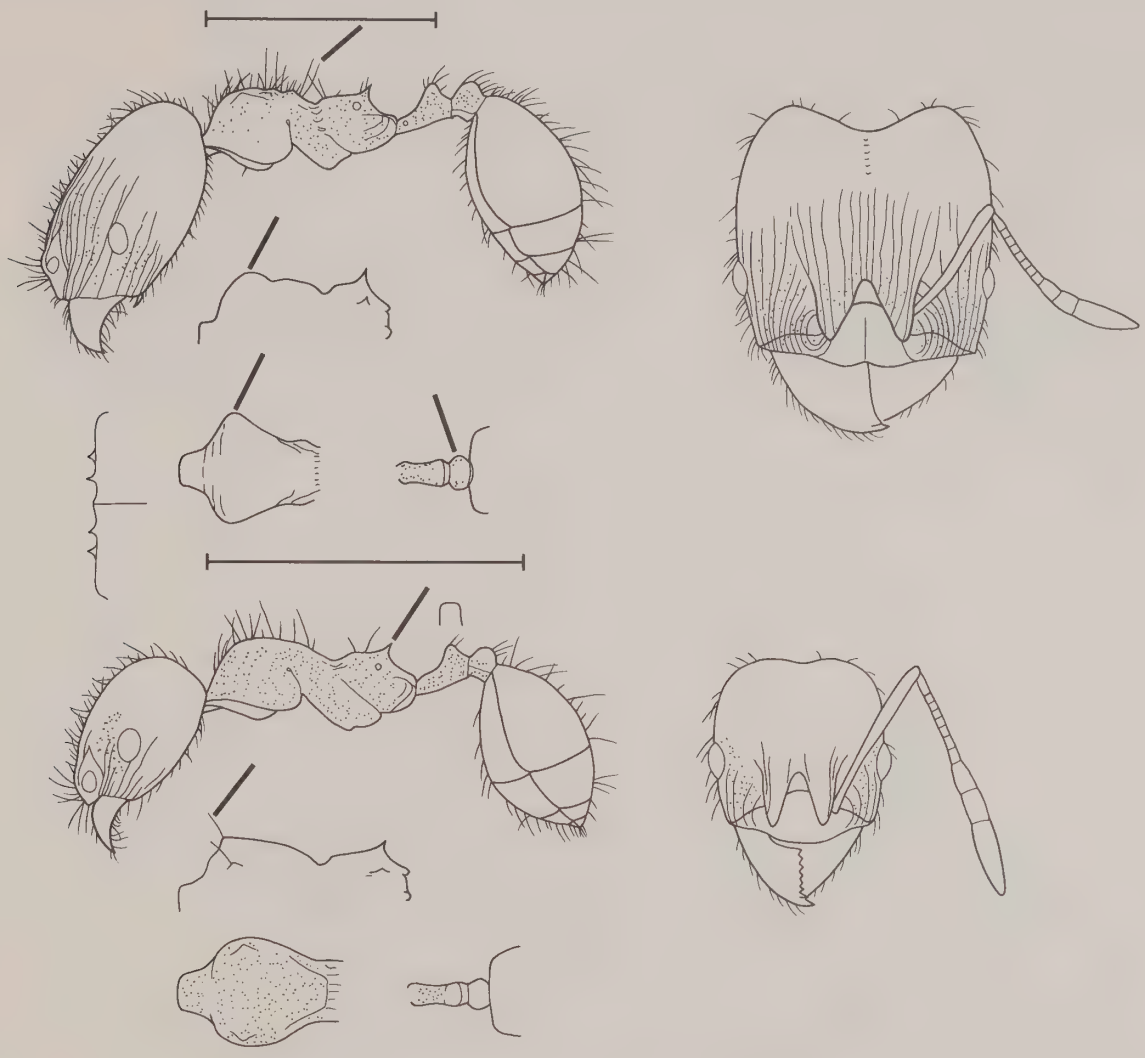
COLOR Major: body and mandibles reddish yellow, legs and antennae plain yellow; head with a medium brown spot just behind the center of the cephalic dorsum midline, as illustrated.

RANGE Known only from the type locality.

BIOLOGY Collected from leaf litter on the sandy soil of the forest floor.

Compare with *arhuaca, caulicola,* and other species listed in the Diagnosis below

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. MEXICO: Mirador, Veracruz (Elisabeth Skwarra). Scale bars = 1 mm.



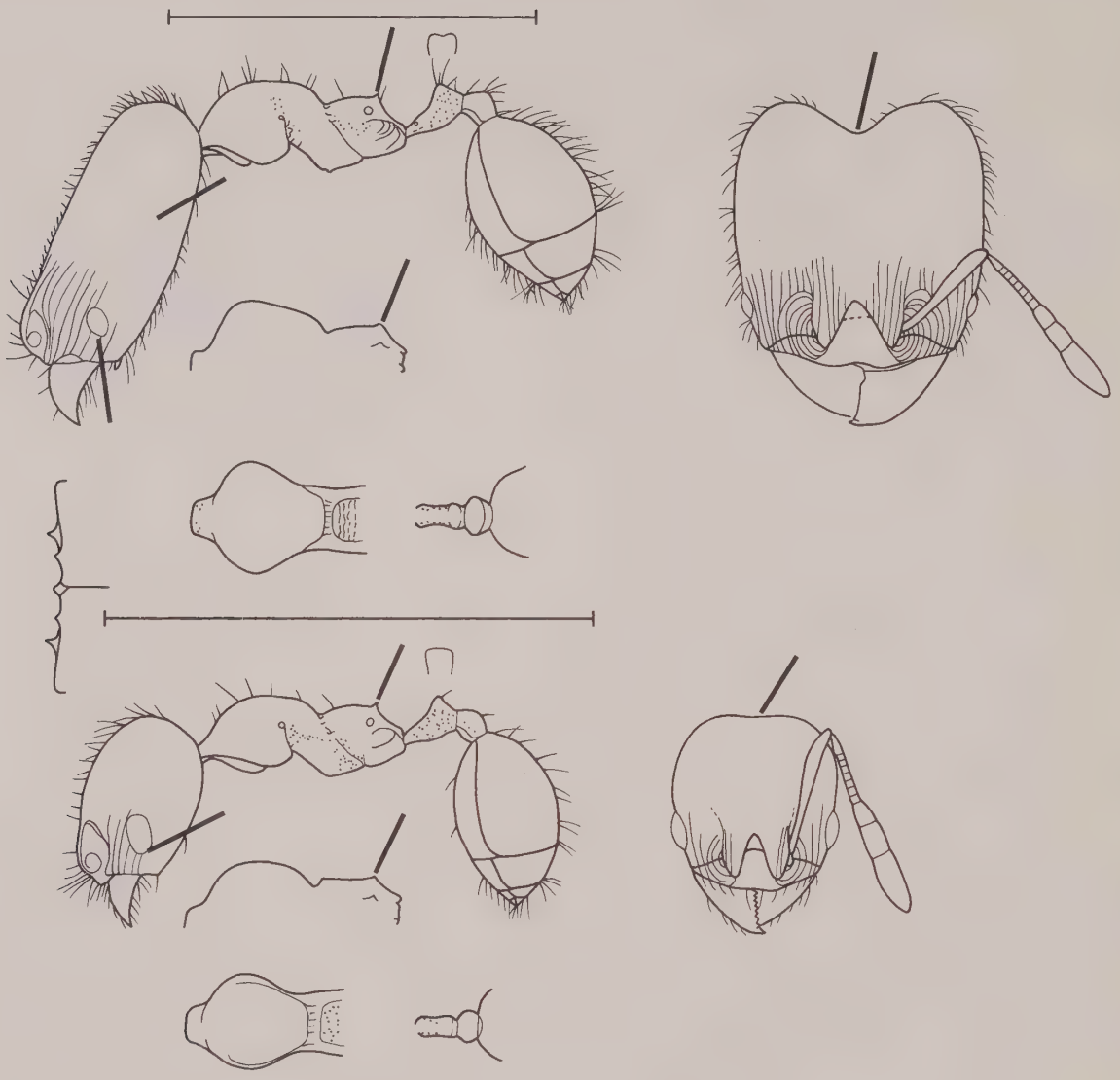
Pheidole sagana Wheeler

Pheidole sagana Wheeler 1934g: 169.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *sagana,* fortune-teller, soothsayer.
DIAGNOSIS A medium-sized, yellowish brown (**major**) to brownish yellow (**minor**) species similar to *arhuaca* and *caulicola,* but differing in the **major** by the more rounded, lower humerus seen in dorsal-oblique view, more distinct mesonotal convexity, and completely smooth promesonotal dorsum; in the **minor** by the smaller propodeal spine and presence of carinulae mesad to the eye; and in both castes by their darker color.
See also the less similar *angulifera, chalca, chalcoides, mincana, schmalzi,* and *tragica.*
MEASUREMENTS (mm) Lectotype major: HW 0.90, HL 0.90, SL 0.44, EL 0.12, PW 0.46.
Paralectotype minor: HW 0.50, HL 0.54, SL 0.44, EL 0.08, PW 0.32.
COLOR Major: concolorous brownish yellow.
Minor: concolorous light, yellowish brown.
RANGE Veracruz, Mexico (type locality) and, according to J. T. Longino, widespread in the Atlantic and Pacific lowlands of Costa Rica.
BIOLOGY Longino (1997): "This species occurs in mature wet forest. It is a relatively common arboreal ant, nesting in dead branches and under epiphytes. Colonies often appear large, with workers scattered over a wide area." Males are present in Wheeler's type series, collected on 16 May in an epiphyte *(Tillandsiarum streptophylla).*

Compare with *christopherseni, exquisita, nigricula, nitella, pygmaea*

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Rio Toro Amarillo, near Guápiles, Limón (W. L. Brown). Scale bars = 1 mm.



Pheidole sagittaria **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *sagittaria,* pertaining to arrows, referring to the head shape of the major.

DIAGNOSIS Similar to the species listed in the heading above, differing as follows.

Major: light brown; head strongly flattened dorsoventrally, so that in side view it is narrowly rectangular; in addition, the head and mandibles together in full-face view are heart-shaped or (adding flattening top to bottom) shaped like an arrowhead; propodeal spines reduced to denticles; apex of petiolar node pointed; carinulae cover most of anterior fourth of dorsal head surface, and almost all of the rest of the body smooth and shiny.

Minor: eye very large, oval, set far forward on head; propodeal spines reduced to denticles; almost all of head and body smooth and shiny.

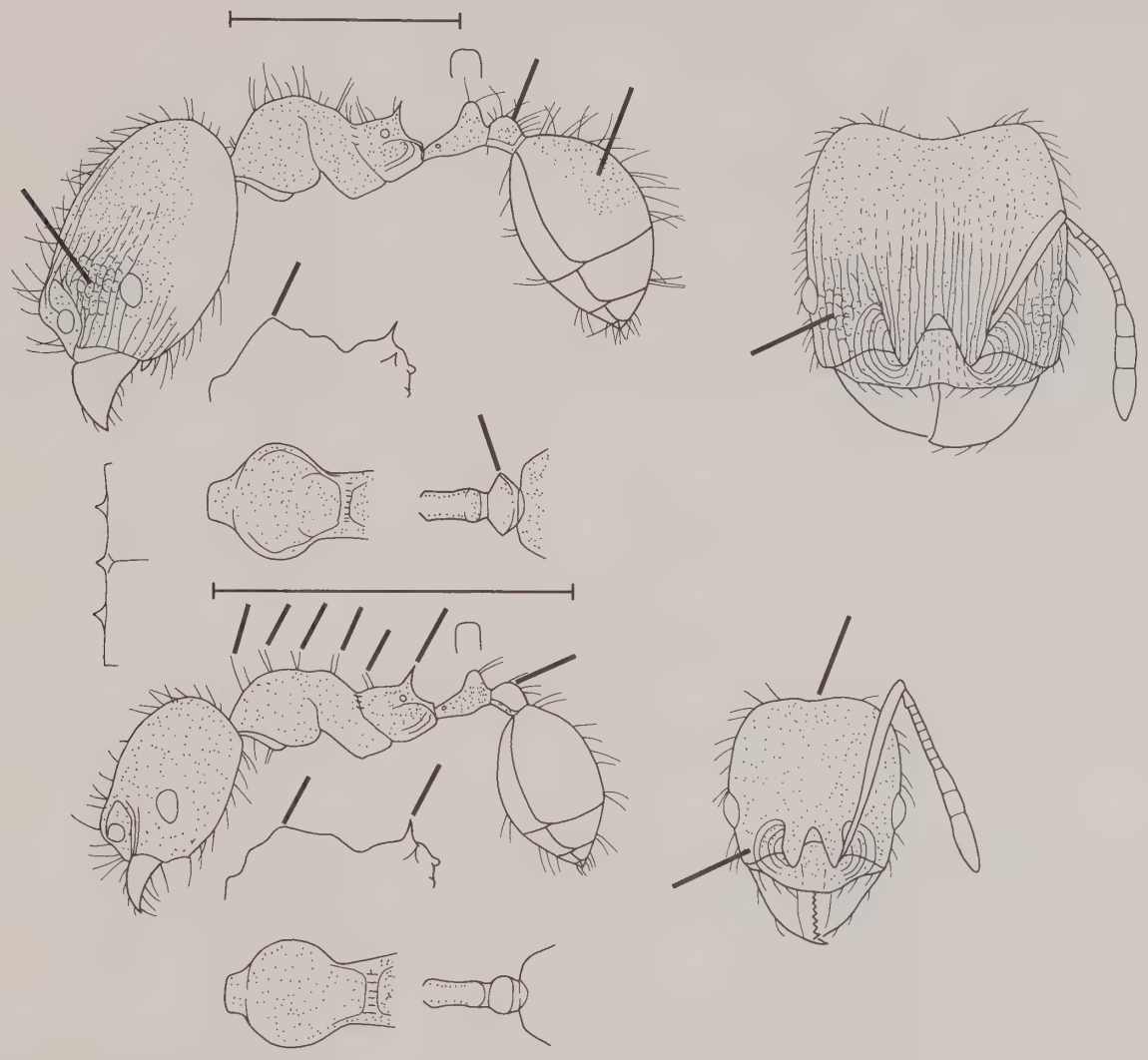
MEASUREMENTS (mm) Holotype major: HW 0.72, HL 0.76, SL 0.38, EL 0.10, PW 0.34.
Paratype minor: HW 0.34, HL 0.36, SL 0.32, EL 0.06, PW 0.22.

COLOR Major: body light brown, appendages yellowish brown.
Minor: body yellowish brown, appendages dark yellow.

RANGE Mostly montane regions of Costa Rica from 500 to 1600 m (Longino 1997).

BIOLOGY According to Longino (1997), *sagittaria* is common in mature wet forests. The two nests he found were, respectively, in a piece of rotten wood on the ground and under the loose bark of a dead tree trunk.

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: 3.2 km west of Fortín, on Highway 150, Veracruz (Stewart B. and Jarmila Kukalová-Peck). Scale bars = 1 mm.



Pheidole scabriventris **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *scabriventris,* rough belly (gaster), referring to the shagreening of the first gastral tergite.

DIAGNOSIS Similar to *mixteca, oaxacana,* and *trageri* of Mexico, differing as follows.

Major: brown, with bluish reflections on first gastral tergite; humerus in dorsal-oblique view raised and subangulate; head quadrate; postpetiolar node from above diamond-shaped; all of anterior half of dorsal head surface carinulate, including clypeus; all of dorsal head surface and of mesosoma foveolate and opaque; anterior two-thirds of central strip of first gastral tergite shagreened and with faint bluish reflections.

Minor: humerus in dorsal-oblique view low and subangulate; postpetiolar node suppressed; pilosity sparse, on mesosomal dorsum consisting of widely and evenly spaced pairs of setae; all of head and mesosoma foveolate and opaque.

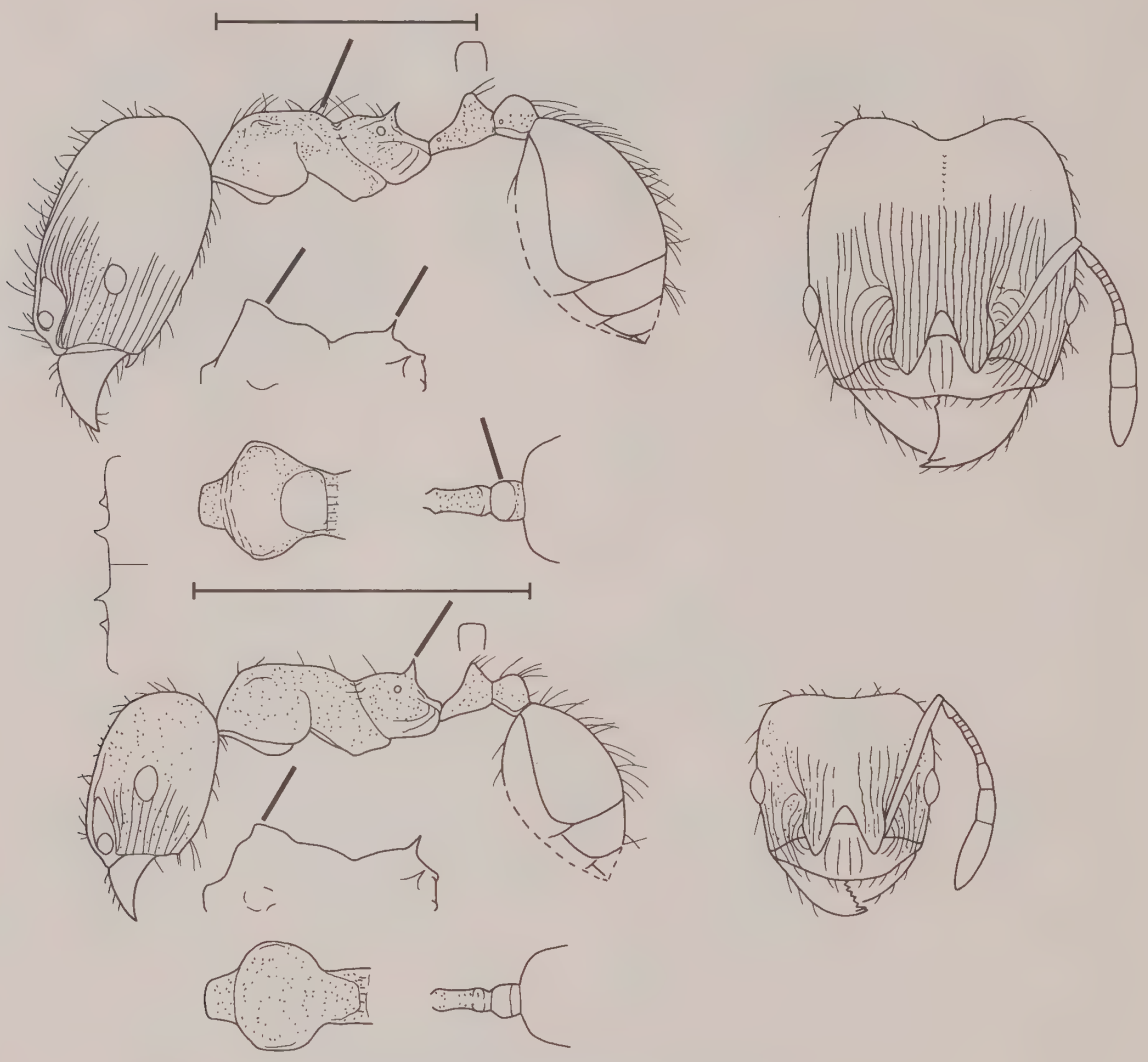
MEASUREMENTS (mm) Holotype major: HW 0.92, HL 0.92, SL 0.50, EL 0.14, PW 0.44.
Paratype minor: HW 0.44, HL 0.52, SL 0.46, EL 0.08, PW 0.30.

COLOR Major: body, mandibles, and most of antennae medium brown; legs brownish yellow.
Minor: body and most of appendages medium brown; tarsi brownish yellow.

RANGE Known from the type locality, and from Estación Biológica Los Tuxtlas, Veracruz.

BIOLOGY The Los Tuxtlas series was taken from ground litter in rainforest (P. S. Ward) and the holotype series from tropical evergreen forest (S. and J. Peck).

FIGURE Upper: major (syntype of synonymous *P. rata* Borgmeier). Lower: minor (syntype of synonymous *P. rata* Borgmeier). BRAZIL: Petrópolis, Rio de Janeiro, type locality of synonymous *P. rata*. (Type locality of *schmalzi*: Joinville, Santa Catarina, Brazil.) Scale bars = 1 mm.

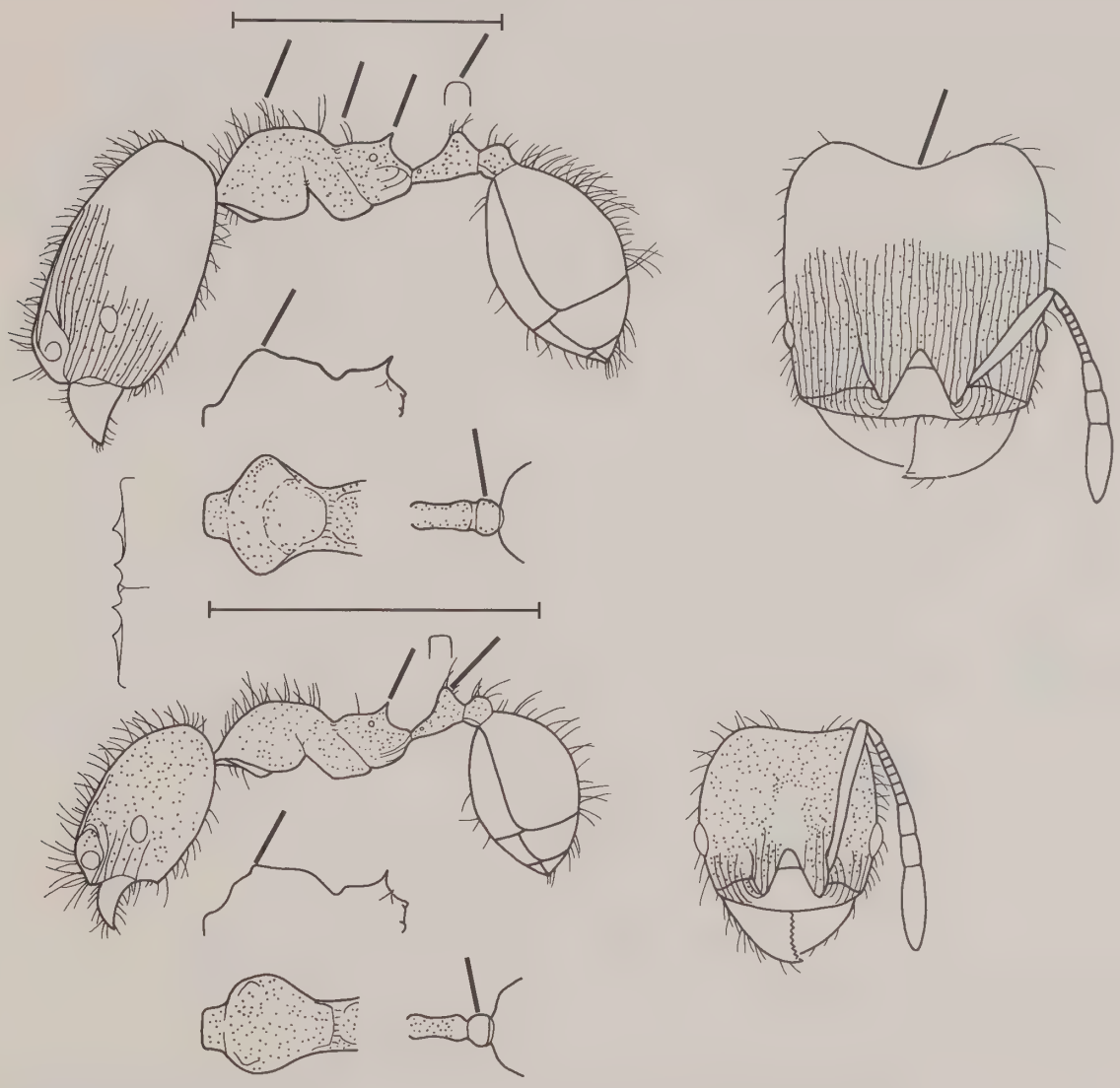


Pheidole schmalzi Emery, **new status**

Pheidole dimidiata var. *schmalzi* Emery 1894d: 161. Syn.: *Pheidole rehi* Forel 1900h: 285, n. syn. *Pheidole rata* Borgmeier 1929: 206, n. syn.

TYPES Lectotype and paralectotype of *schmalzi*: Mus. Civ. Hist. Nat. Genova.
ETYMOLOGY Named after the collector "Signor Schmalz."
DIAGNOSIS A medium-sized reddish yellow to brown member of the *flavens* group; both **major** and **minor** are immediately recognizable by the large, "sharkfin" shape of the humerus in dorsal-oblique view, meaning that the anterior margin is straight and the posterior margin convex in profile, tipped with an acute or right angle. Very similar to *angulifera,* and in varying degree also to *arhuaca, caulicola, chalca, chalcoides, mincana, sagana, tambopatae,* and *tragica* in overall appearance but distinctive in the humeral shape and other traits in body shape, sculpture, pilosity, and color.
MEASUREMENTS (mm) Lectotype major: HW 0.94, HL 0.94, SL 0.46, EL 0.10, PW 0.48.
Paralectotype minor: HW 0.50, HL 0.54, SL 0.58, EL 0.08, PW 0.34.
COLOR Lectotype major of *schmalzi*: body and appendages light brown, waist and gaster dark brown (*rehi* syntype major is yellowish brown; *rata* syntype major is light reddish yellow).
Paralectotype minors of *schmalzi*: body light to medium brown, appendages light brown.
Syntype minors of synonymous *rehi* and *rata*: light brown.
RANGE Santa Catarina and Rio de Janeiro, Brazil; Bolivia; Venezuela.
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Llorona, Osa Peninsula, Corcovado National Park, 8°35′N 83°42′W, 0–100 m (J. T. Longino). Scale bars = 1 mm.



Pheidole scitula **new species**

TYPES INBio.

ETYMOLOGY L *scitula,* beautiful, elegant.

DIAGNOSIS A medium-sized, brown member of the *flavens* group, most similar to *boliviana,* differing in the **major** in its more prominent, bulbous humerus, flatter promesonotal profile, less convex petiolar node seen from behind, semi-circular shape of the postpetiolar node seen from above, and less extensive cephalic sculpture. Also similar, but less so, to *amabilis, melastomae, mixteca, terresi,* and *tysoni* in many details, as depicted in the figures of the respective species.

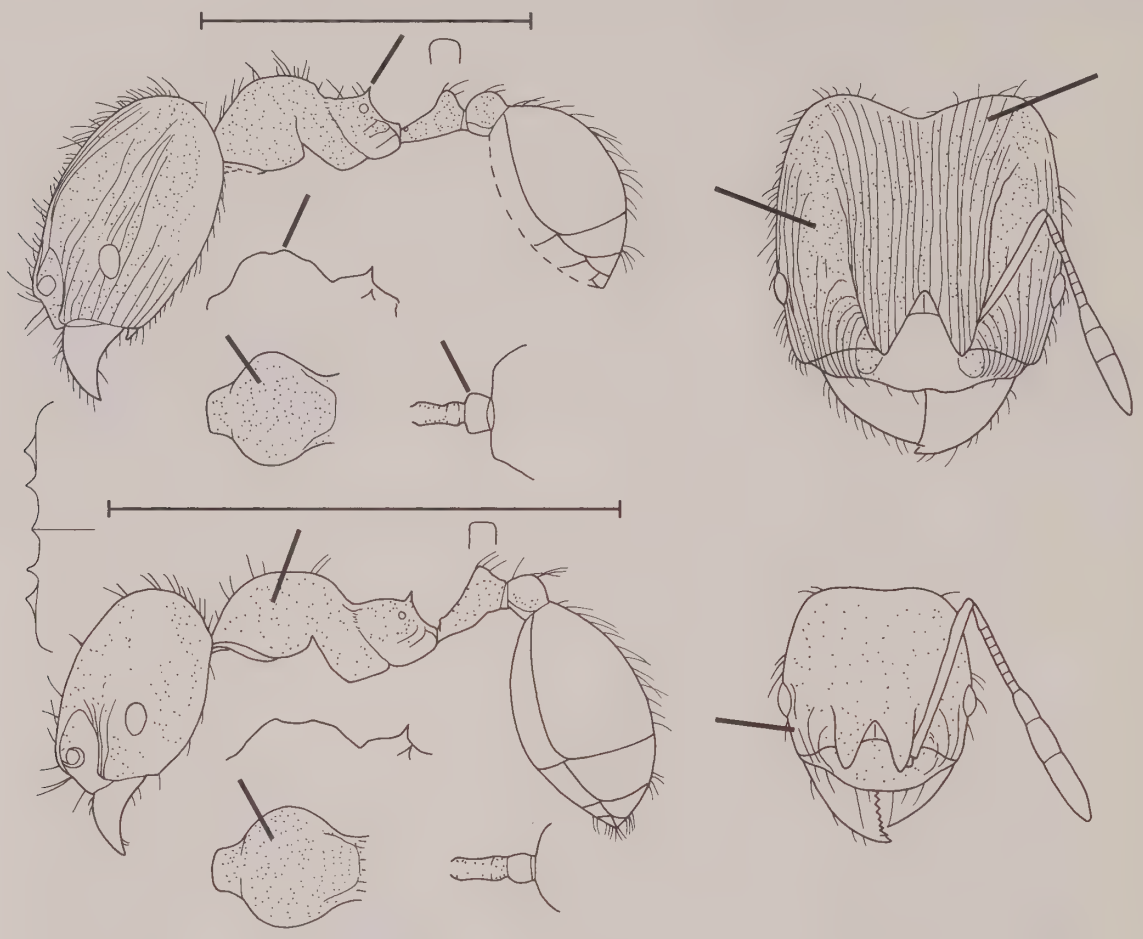
MEASUREMENTS (mm) Holotype major: HW 0.84, HL 0.90, SL 0.42, EL 0.08, PW 0.44.
Paratype minor: HW 0.46, HL 0.50, SL 0.42, EL 0.06, PW 0.28.

COLOR Major: concolorous medium reddish brown.
Minor: body medium brown, appendages brownish yellow.

RANGE Known only from the type series.

BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ST. VINCENT, WEST INDIES (H. H. Smith). Scale bars = 1 mm.

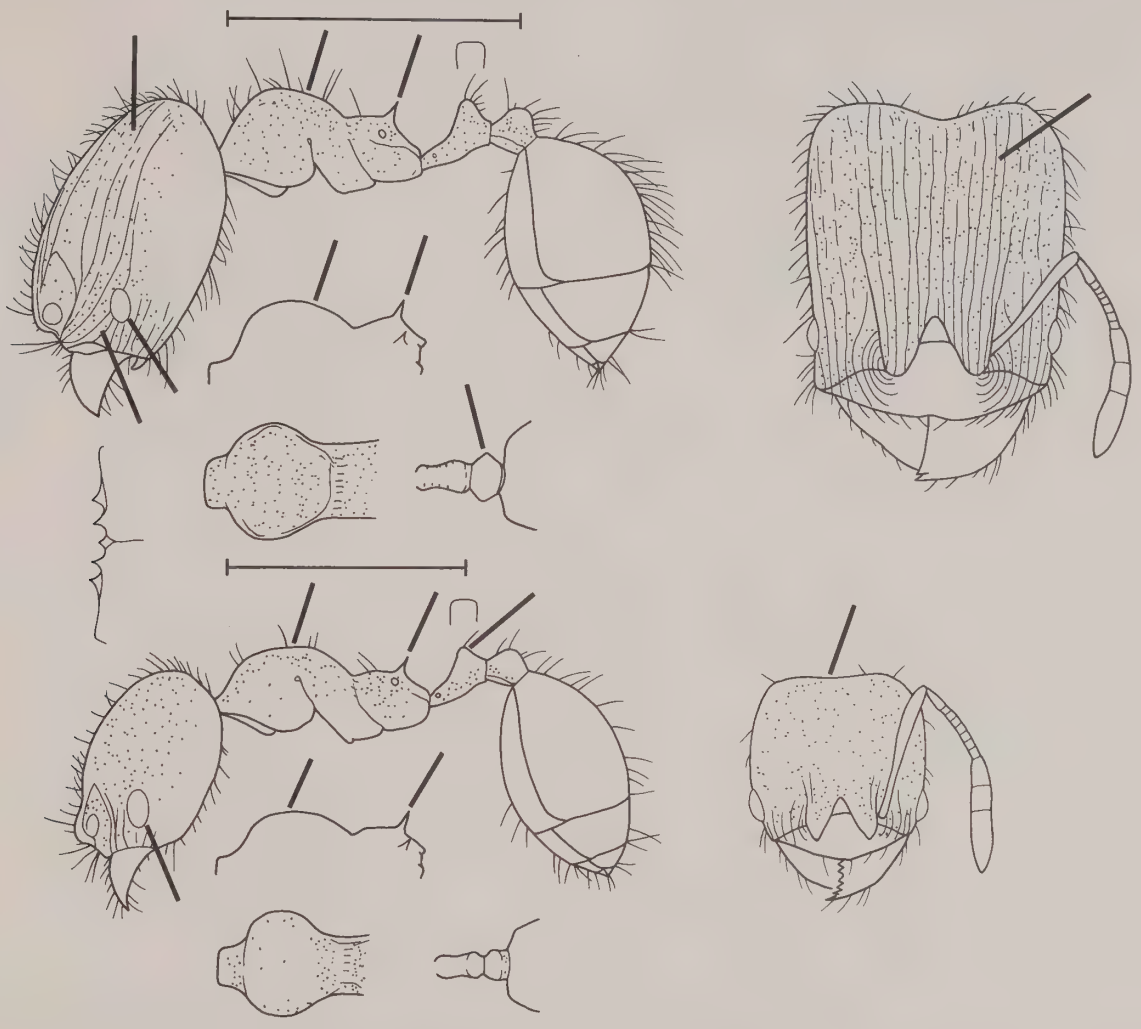


Pheidole sculptior Forel, **new status**

Pheidole flavens r. *sculptior* Forel 1893j: 414.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY L *sculptior,* more engraved, presumably with reference to the more extensive sculpturing of the major head.
DIAGNOSIS A member of the "*flavens* complex" within the larger *flavens* group, comprising *asperithorax, breviscapa, cardiella, chloe, exigua, flavens, goeldii, moerens, mittermeieri, nuculiceps, pholeops, sculptior, striaticeps,* and *trinitatis,* differing in the following combination of traits.
Major: carinulae originating on frontal lobes and mesad to frontal carinae travel all the way to the occipital border, turning slightly away from the midline as they progress; shallow antennal scrobes present, their surfaces foveolate and opaque and bearing carinulae inside their anterior half; in dorsal-oblique view, promesonotal dorsal profile is weakly bilobous and descends posteriorly through a gentle gradient to the metanotal groove; pronotal dorsum foveolate and opaque, entirely lacking in carinulae; postpetiolar node trapezoidal viewed from above.
Minor: close to *flavens,* with carinulae restricted to anterior half of head, and all of head, mesosoma, and side of waist foveolate and opaque.
MEASUREMENTS (mm) Lectotype major: HW 0.78, HL 0.78, SL 0.42, EL 0.10, PW 0.34.
Paralectotype minor: HW 0.38, HL 0.42, SL 0.36, EL 0.06, PW 0.24.
COLOR Major: mandibles and most of body light brownish yellow; gaster, antennae, and legs medium yellow.
Minor: concolorous yellow.
RANGE Recorded by Kempf (1972b) from Puerto Rico, Martinique, St. Vincent, Trinidad, and Venezuela. I have confirmed series from Puerto Rico, St. Vincent, Trinidad, and Suriname.
BIOLOGY On St. Vincent in the early 1890s, the avid collector H. H. Smith (in Forel 1893j) found *sculptior* to be relatively scarce but very adaptable in habitat. Ranging from sea level to 500 m, it occurred in forests, seashore thickets, and open land. Nests were in loamy soil under pieces of dead wood or stones; one was found in a piece of rotten wood. The colonies were small, in one instance noted by Smith comprising about 200 workers. On Grenada in 1995, Stefan Cover and I found a colony under a rock in a banana plantation at 300 m. On Trinidad, Cover found two other colonies under the bark of rotting logs. A male was present with one of the latter on 19 May, and a winged queen with a Puerto Rico colony collected by J. A. Torres on 26 November.

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Represa Calima, above the dam, Valle, 1600 m (W. L. Brown and R. B. Root). Scale bars = 1 mm.

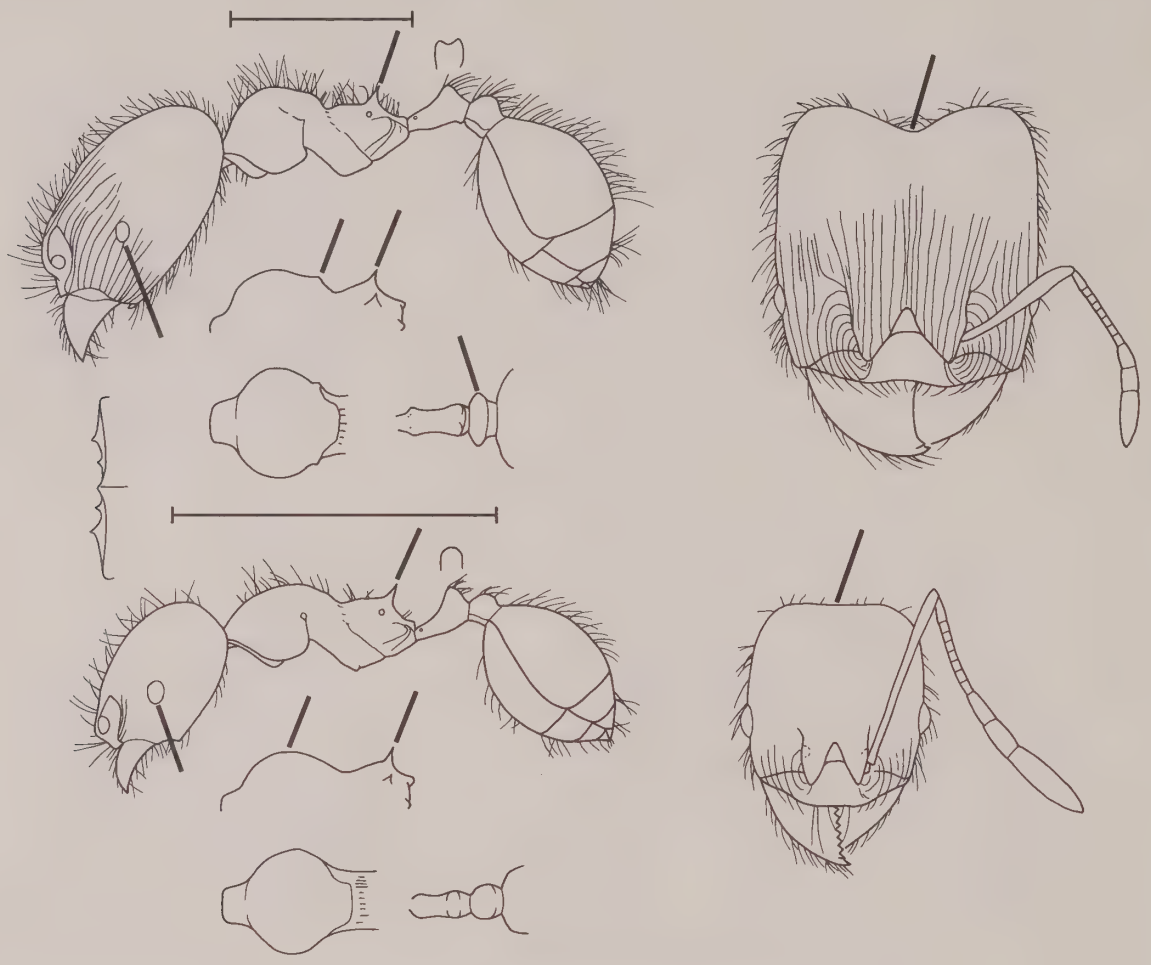


Pheidole servilia **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after Julius Caesar's mistress, and powerful political figure following the assassination.
DIAGNOSIS Similar in various ways to *albipes, alticola, browni, cardiella, chalca, euryscopa, hedlundorum, lustrata, monteverdensis,* and *palenquensis,* differing as follows.
Major: head subrectangular in full-face view; eye set far forward on head; in side view, carinulae originate on lower anterior margin of eye and just above it curve and travel mesally; profile of promesonotum almost perfectly semicircular; propodeal spines medium-long and thin; postpetiole from above diamond-shaped; almost all of dorsal surface of head, including occiput, carinulate; all of mesosoma and almost all of dorsal head surface foveolate.
Minor: eye very far forward on head, its distance from the anterior genal border much less than an Eye Length; promesonotal profile a nearly perfect semicircle; propodeal spines medium-length and thin; dorsal surface of head and most of mesosoma variably foveolate.
MEASUREMENTS (mm) Holotype major: HW 0.60, HL 0.66, SL 0.34, EL 0.08, PW 0.34.
Paratype minor: HW 0.42, HL 0.44, SL 0.36, EL 0.08, PW 0.26.
COLOR Major: body medium reddish yellow, appendages light reddish yellow.
Minor: concolorous plain medium yellow.
RANGE Known only from the type locality.
BIOLOGY Found in montane rainforest.

Compare with species listed
in the Diagnosis below

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. CUBA: Buenos Aires, Trinidad Mts., Las Villas, 750–1100 m (P. J. Darlington). Scale bars = 1 mm.

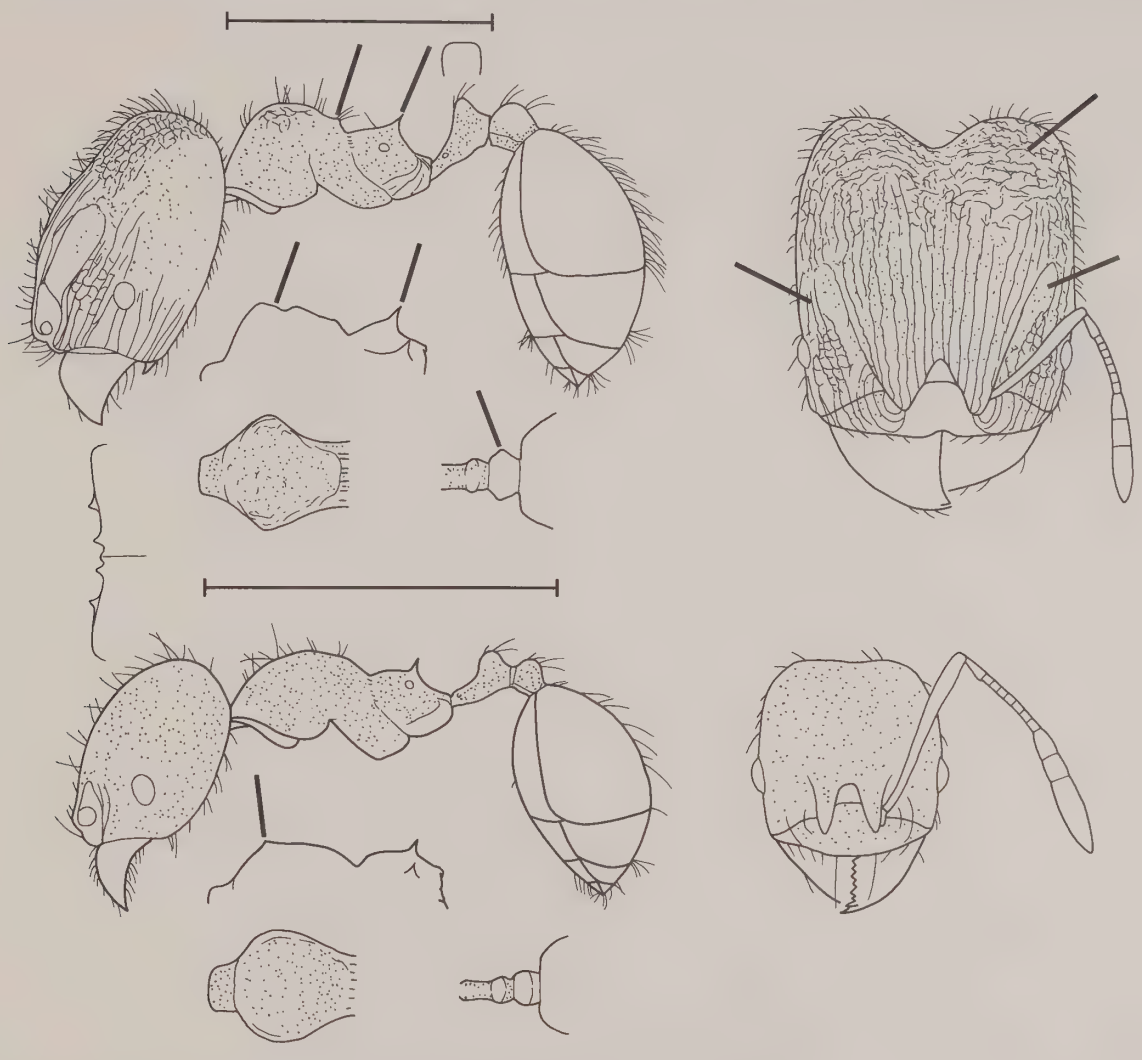


Pheidole similigena Wheeler

Pheidole similigena Wheeler 1937b: 446.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *similigena,* similar cheeks (genae), allusion unknown.
DIAGNOSIS Especially similar to *terresi* of Hispaniola but also sharing traits with *amabilis, arhuaca, citrina, crinita, delicata, hedlundorum, laselva, mallota, melastomae, nitidicollis,* and *tillandsiarum,* differing as follows.
Major: light reddish brown; eyes very small, Eye Length less than one-tenth Head Width; head subrectangular, with moderately deep occipital cleft; mesonotal convexity present but rudimentary; carinulae cover most of anterior half of dorsal head surface, and rest of body entirely smooth and shiny; propodeal spines moderately long, and thick at base; postpetiole from above elliptical, with angulate sides.
Minor: body almost completely smooth and shiny; eyes relatively small; occiput broad, its margin flat in full-face view; propodeal spines moderately long and thin.
MEASUREMENTS (mm) Lectotype major: HW 0.96, HL 1.08, SL 0.50, EL 0.08, PW 0.46.
Paralectotype minor: HW 0.44, HL 0.50, SL 0.44, EL 0.08, PW 0.30.
COLOR Major: concolorous light reddish brown except for gaster, which is medium reddish brown.
Minor: concolorous light yellowish brown.
RANGE In addition to the types from Las Villas Province, I have seen specimens from Sierra de Mesa, Pinar del Rio, also in Cuba (Jorge Fontenla).
BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: São Paulo. Scale bars = 1 mm.



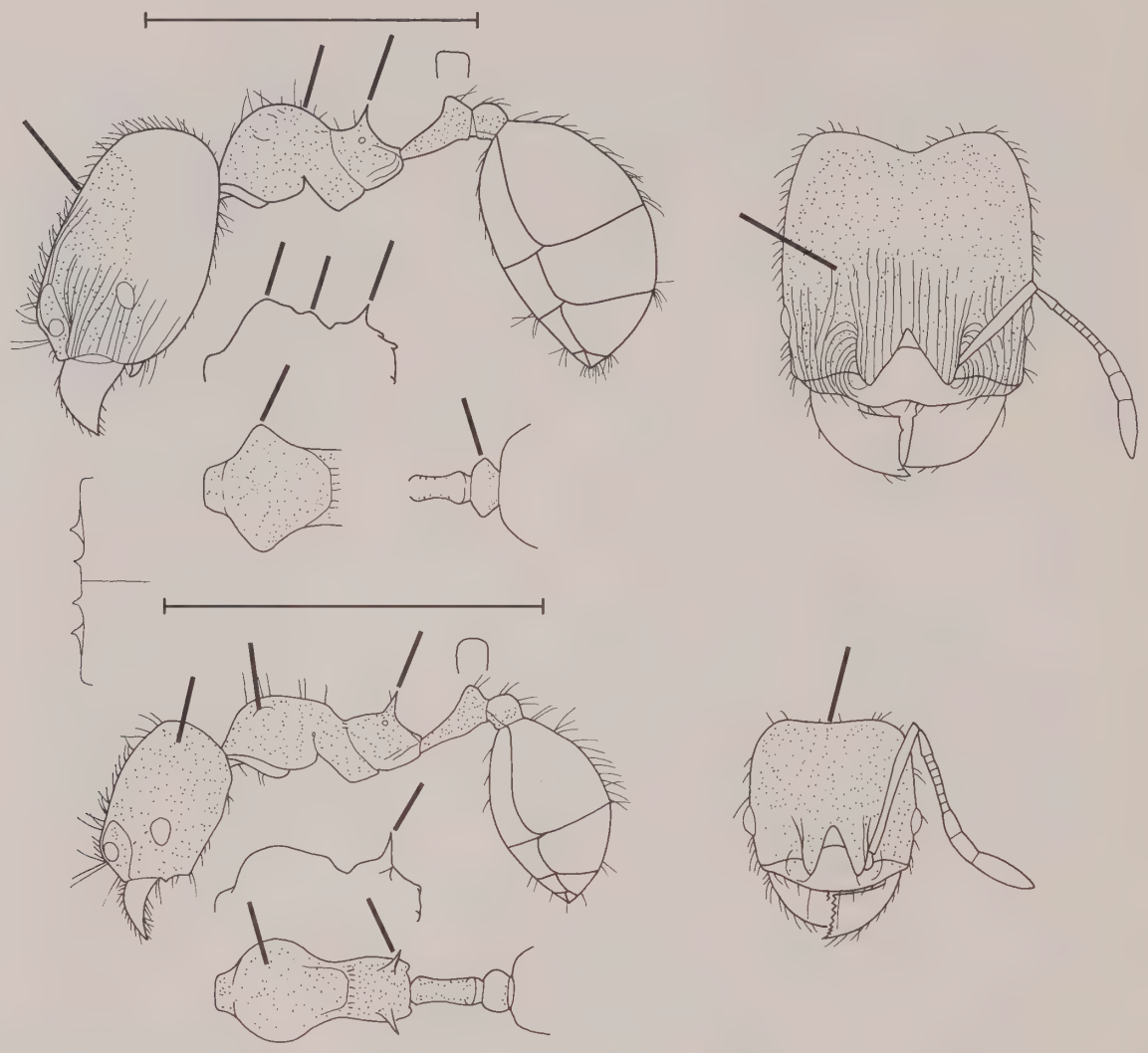
Pheidole sospes Forel, **new status**

Pheidole anastasii var. *sospes* Forel 1908h: 381. Syn.: *Pheidole minutissima* Kusnezov 1952d: 69, 78, n. syn.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY L *sospes,* saving, delivering, significance unknown.
DIAGNOSIS A medium-sized, yellow member of the *flavens* group; the **major** has shallow but well-developed antennal scrobes; rugoreticulation across all of the occiput; a small mesonotal convexity, and angulate lateral postpetiolar margins, as well as posteriorly directed propodeal spine and rugoreticulate humerus. Resembles *ademonia* and *peltastes,* but easily distinguished by many features of sculpturing, development of the scrobe, and presence in the **major** of the mesonotal convexity, as illustrated.
MEASUREMENTS (mm) Lectotype major: HW 0.84, HL 0.92, SL 0.44, EL 0.12, PW 0.44.
Paralectotype minor: HW 0.44, HL 0.46, SL 0.42, EL 0.08, PW 0.30.
COLOR Major: appendages and gaster clear yellow, rest of body a slightly contrasting reddish yellow ("orange").
Minor: concolorous clear yellow.
RANGE São Paulo, Brazil; Misiones (El Dorado) in extreme northeastern Argentina; and Cuzco Amazónico, near Maldonado, Madre de Dios, Peru.
BIOLOGY At Cuzco Amazónico, Stefan Cover and John E. Tobin collected four colonies, all in terra firme forest, nesting in small rotten sticks on the forest floor.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Arboretum, La Selva Biological Station, near Puerto Viejo, Heredia (Stefan Cover). Scale bars = 1 mm.



Pheidole specularis **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *specularis,* of a mirror, alluding to the shiny gaster.

DIAGNOSIS Similar to *chalca, daphne, floridana, nebulosa, quercicola,* and *stomachosa,* differing as follows.

Major: mostly reddish yellow; head in full-face view subrectangular; posterior dorsal profile of head flat, not convex; promesonotal profile raised, semicircular; humeri from above subangular, extending beyond rest of pronotum below and only moderately prominent, along with mesonotal convexity in dorsal-oblique view; propodeal spines robust, more than half as long as the propodeal basal face anterior to them; all of mesosoma and most of dorsal surface of head foveolate and opaque; gaster completely smooth.

Minor: head subrectangular in side view; occiput broad and slightly concave; propodeal spines robust and half as long as propodeal basal face; all of head, mesosoma, and gaster foveolate and opaque; gaster completely smooth and shiny.

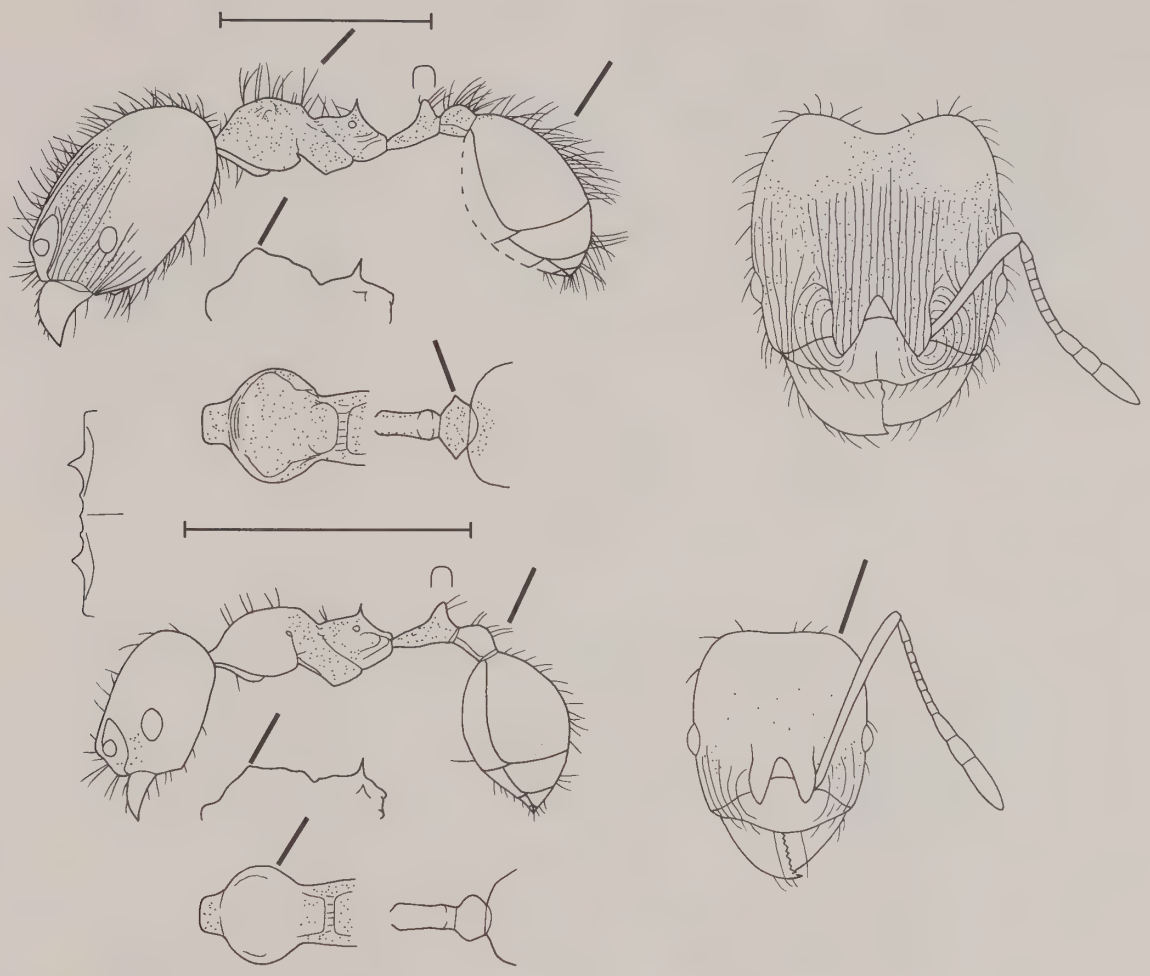
MEASUREMENTS (mm) Holotype major: HW 0.82, HL 0.88, SL 0.40, EL 0.10, PW 0.44.
Paratype minor: HW 0.44, HL 0.46, SL 0.36, EL 0.10, PW 0.30.

COLOR Major: all of body and appendages medium reddish yellow except for gaster, which is brownish yellow.
Minor: body and mandibles medium reddish yellow, rest of appendages clear medium yellow.

RANGE Atlantic slope to 1200 m and Pacific lowlands, Costa Rica (J. T. Longino 1997).

BIOLOGY The species occurs in both lowland and montane rainforest, where the colonies nest both in dead wood on the forest floor and in live plant cavities and under epiphytes; workers have been observed attending extrafloral nectarines (Longino 1997).

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. JAMAICA: Newton, 900 m (Charles T. Brues). Scale bars = 1 mm.



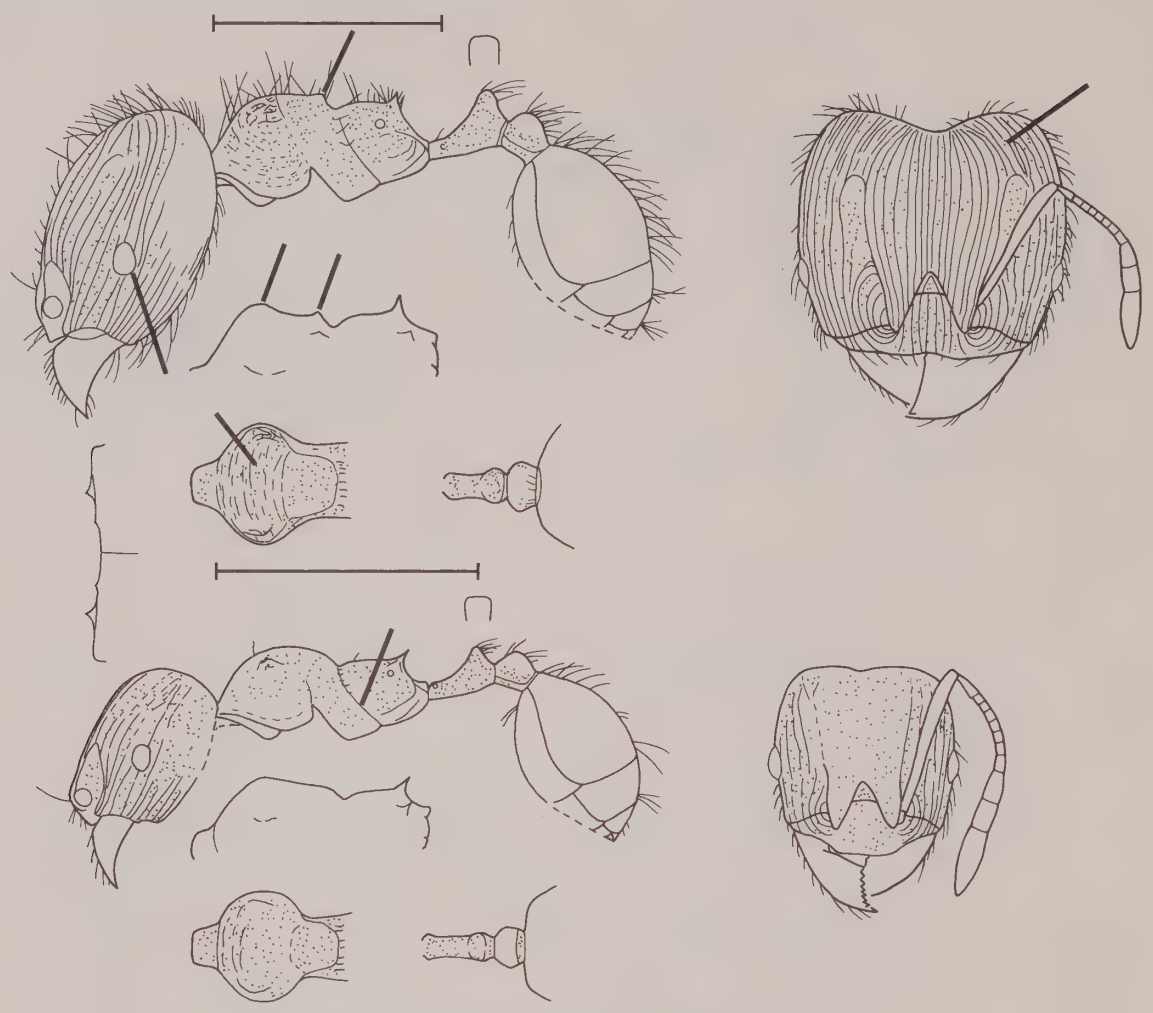
Pheidole stomachosa Wheeler, **new status**

Pheidole floridana subsp. *stomachosa* Wheeler 1917g: 459.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *stomachosa,* angry, irritable.
DIAGNOSIS Nearly identical to *bilimeki* and *floridana* (q.v.). Differs from both in the mostly smooth and feebly shiny pronotum of the **minor**, and possibly the weakly bilobous outline of the pronotum in dorsal-oblique view; and from *bilimeki* in addition by the complete or near absence of shagreening from the first gastral tergite. There also may be small differences in the **major** in pilosity (as illustrated) and Color (described below).
MEASUREMENTS (mm) Lectotype major: HW 0.90, HL 0.96, SL 0.52, EL 0.12, PW 0.44.
Paralectotype minor: HW 0.44, HL 0.48, SL 0.46, EL 0.10, PW 0.26.
COLOR Major: body dark yellow, with slight reddish overtones (hence faintly "orange"), appendages clear yellow.
Minor: concolorous yellow.
RANGE Known only from Jamaica, hence a weakly defined endemic of the island. It coexists there with the closely related *bilimeki*.
BIOLOGY Unknown.

Compare with *cardiella, chloe, goeldii, mittermeieri, nuculiceps, sculptior*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. MEXICO. Scale bars = 1 mm.



Pheidole striaticeps Mayr

Pheidole striaticeps Mayr 1870b: 987.

TYPES Naturhist. Mus. Wien.

ETYMOLOGY L *striaticeps,* lined (striate) head.

DIAGNOSIS A member of the *flavens* group close to *chloe,* less so to the other species listed in the heading, distinguished as follows.

Major: antennal scrobes present; entire dorsal surface of head covered by longitudinal carinulae, which curve inwardly toward midline at occiput; humerus prominent and rounded in dorsal-oblique view; mesonotal convexity present, especially in dorsal-oblique view; head wider than long (Head Width/Head Length 1.03); pronotum transversely carinulate.

Minor: carinulae absent from around thorax-propodeal suture.

MEASUREMENTS (mm) Lectotype major: HW 1.06, HL 1.02, SL 0.56, EL 0.12, PW 0.50.

Paralectotype minor: HW 0.62, HL 0.62, SL 0.56, EL 0.08, PW 0.42.

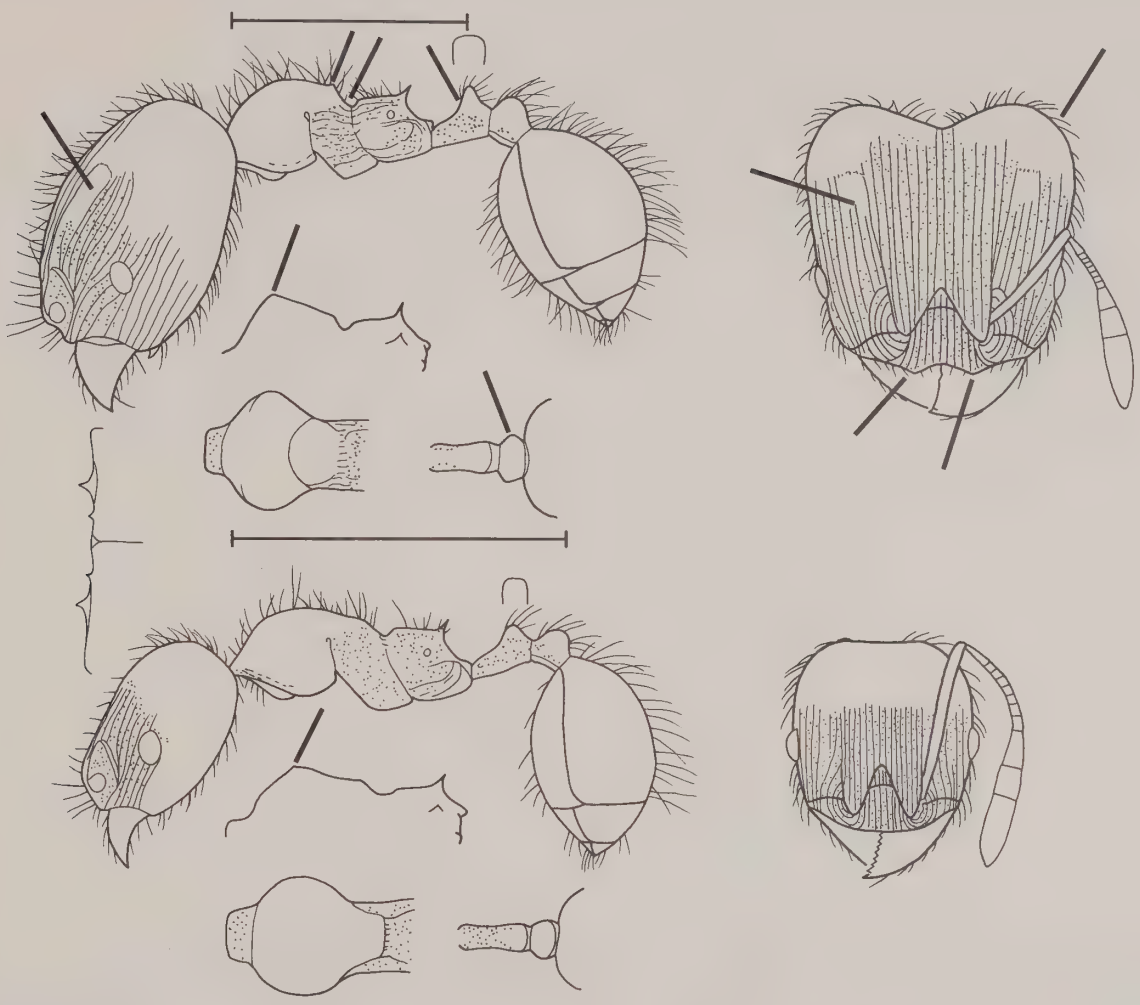
COLOR Major: concolorous light reddish brown.

Minor: concolorous light reddish brown.

RANGE Mexico (almost certainly tropical Mexico), Honduras, Costa Rica, and Amazonian Peru. Longino (1997) does not distinguish this species from *chloe,* although the two are different. He reports *"striaticeps,"* which may include both species, from the Atlantic slope to 500 m and Pacific lowlands of Costa Rica.

BIOLOGY Longino (1997) reports *"striaticeps,"* which may include both true *striaticeps* and *chloe,* from mature rainforest, nesting under the bark of rotting stumps and logs. At Cuzco Amazónico, near Puerto Maldonado, Stefan Cover and John E. Tobin found a colony in a gap within mature rainforest, beneath the bark of a rotten but still hard log.

FIGURE Upper: holotype, major. Lower: paratype, minor. VENEZUELA: Rio Negro Táchira, 550 m (John Lattke). Scale bars = 1 mm.



Pheidole styrax **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *styrax,* point at the butt end of a spear, referring to narrow petiolar node of the major.

DIAGNOSIS A medium-large, brown member of the *flavens* group whose **major** is distinguished by the unusual bidentate anterior margin of the clypeus; heart-shaped frontal profile of the head; completely carinulate clypeus; shallow antennal fossa; high, subangulate pronotal humerus in dorsal-oblique view; angulate mesonotal convexity and deep, semicircular metanotal groove; and narrow petiolar node in side view.

Similar to *bidens* in possession of a bidentate clypeus and general habitus but differing in presence of an antennal scrobe and many other details of body form, sculpturing, pilosity, and color, as shown and described (q.v.).

See also the less similar *moffetti, nasutoides,* and *tennantae*.

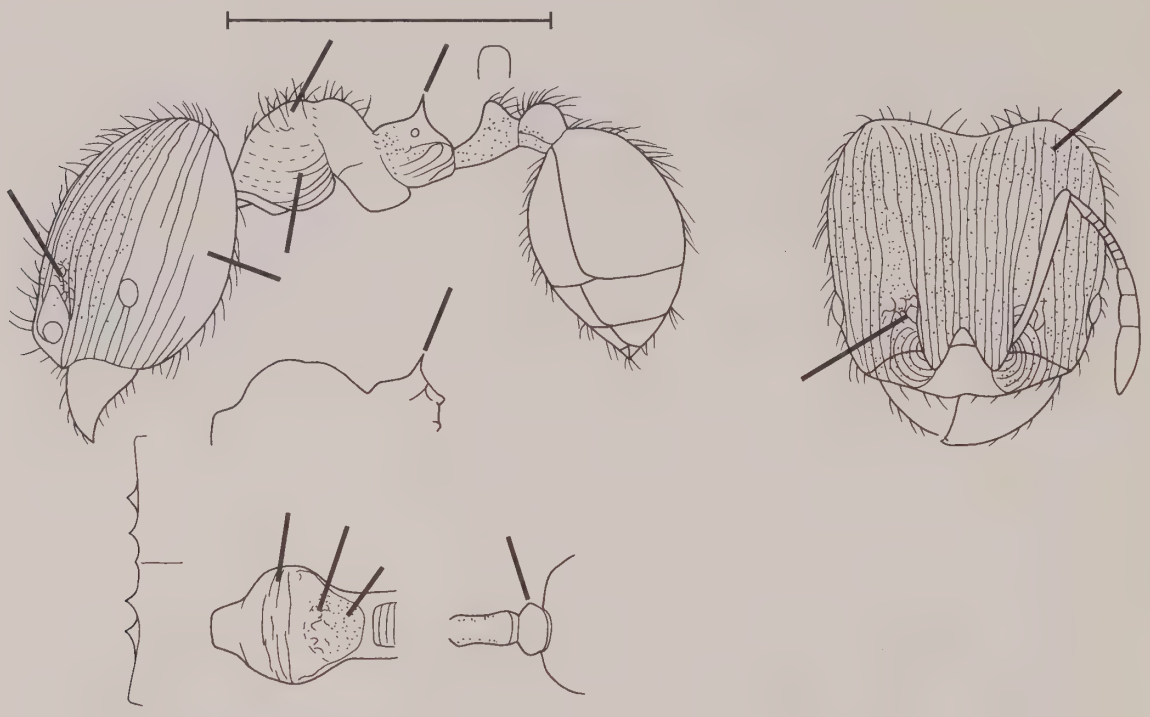
MEASUREMENTS (mm) Holotype major: HW 1.04, HL 1.12, SL 0.58, EL 0.14, PW 0.52.
Paratype minor: HW 0.60, HL 0.62, SL 0.54, EL 0.12, PW 0.38.

COLOR Major: body and mandibles medium brown, other appendages yellowish brown.
Minor: body light brown, appendages brownish yellow.

RANGE Known only from the type series.

BIOLOGY Unknown.

FIGURE Syntypes, major, a composite of two specimens from the type series. Minor unknown. BRAZIL: Mato Grosso. Scale bar = 1 mm.

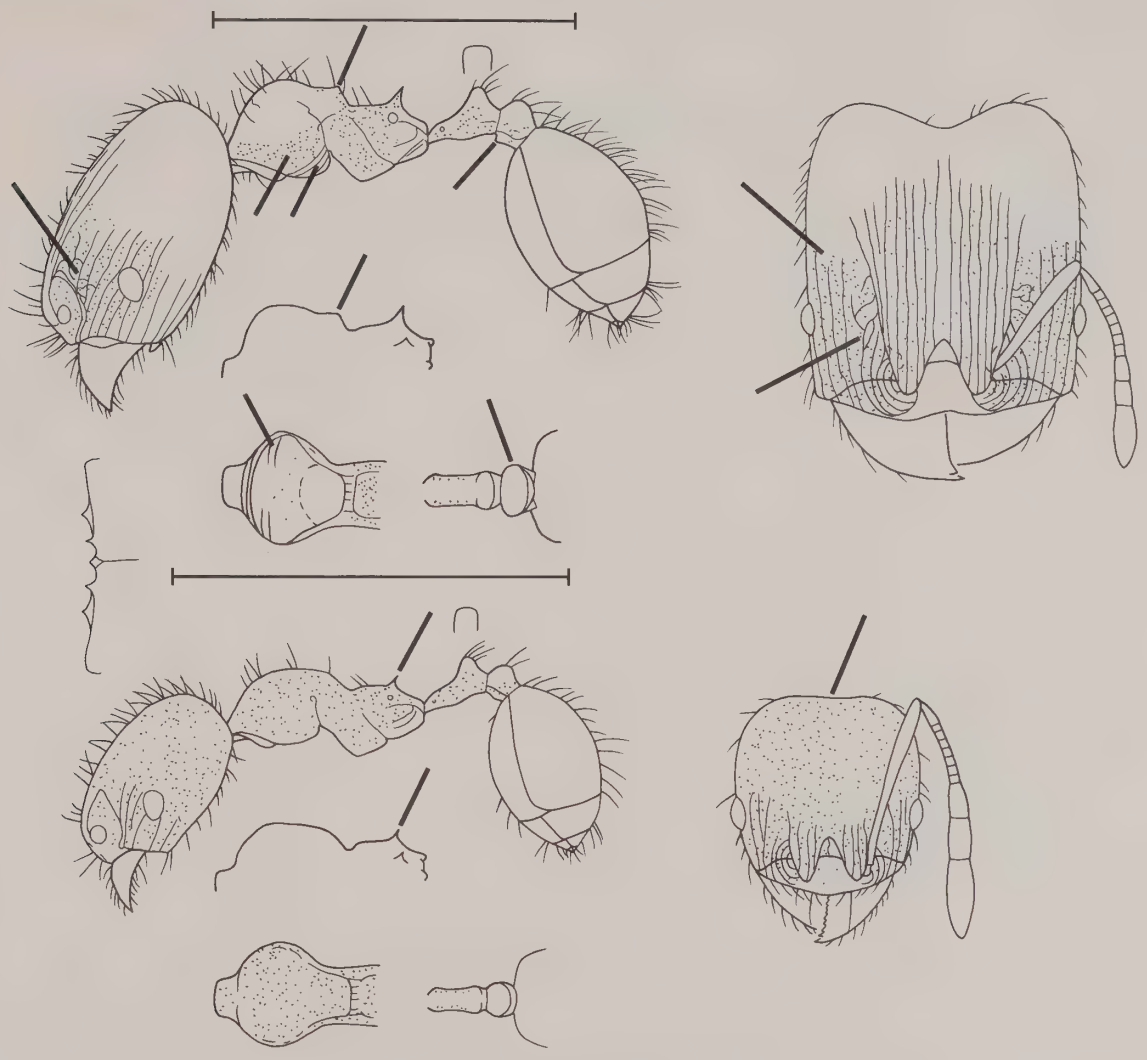


Pheidole subreticulata Emery, **new status**

Pheidole nana var. *subreticulata* Emery 1894d: 159.

TYPES Mus. Civ. Stor. Nat. Genova.
ETYMOLOGY L *subreticulata,* less netlike, evidently referring to the small rugoreticulum on the head.
DIAGNOSIS Similar in various traits to *breviscapa, bruchella, micon, nana*, and *tennantae,* differing as follows.
Major: rugoreticulum limited to a very small patch just posterior to the antennal fossa on each side of the head; almost all of the dorsal surface and most of the lateral surfaces of the head, up to and including the occiput, carinulate; center of pronotal dorsum transversely carinulate, and sides weakly and longitudinally carinulate; mesonotal dorsum foveolate with a few broken, very short rugulae; propodeal spines half as long as the propodeal basal face; petiolar node in side view thick near base, tapering toward apex; postpetiole from above diamond-shaped.
MEASUREMENTS (mm) Syntype major: HW 0.96, HL 0.96, SL 0.58, EL 0.10, PW 0.46.
COLOR Not recorded.
RANGE Known only from the type locality.
BIOLOGY Unknown.

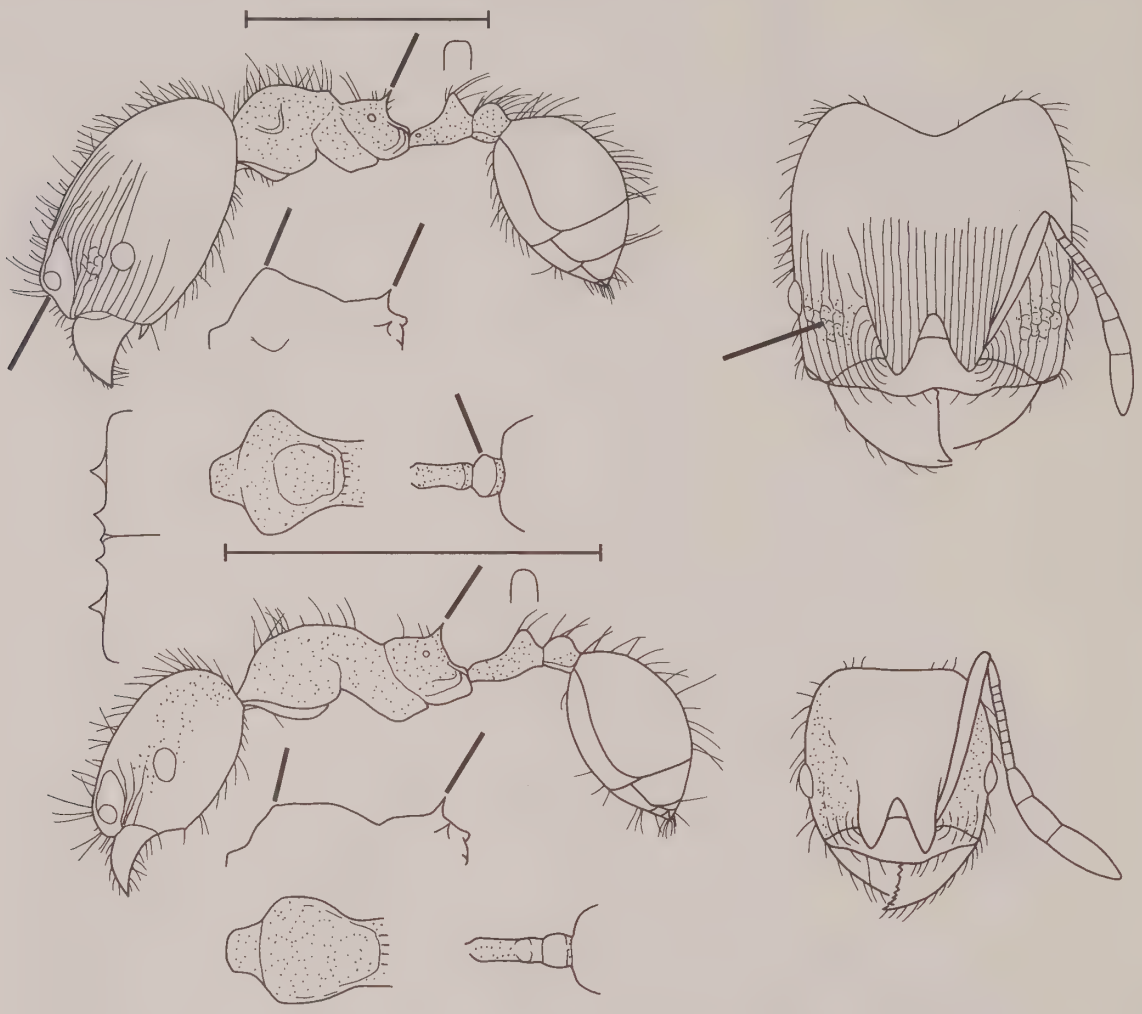
FIGURE Upper: holotype, major. Lower: paratype, minor. VENEZUELA: El Espinal, near Michelena, Táchira, 1260 m (John Lattke). Scale bars = 1 mm.



Pheidole tachirana **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the state in which the type colony was found.
DIAGNOSIS Similar in various traits to *cerina, hizemops, mackayi, micon,* and *tenebra,* differing as follows.
Major: reddish yellow; mesonotal convexity subangular; small subangulate process present on postpetiolar venter; anterior third of dorsum and posterior lower margin of pronotum carinulate; lower sides of pronotum foveolate; a small patch of rugoreticulum present posterior to each antennal fossa; carinulae just mesad to each eye extend only about 2× Eye Length beyond the eye.
Minor: head and mesosoma entirely foveolate; propodeal spines short and thin; occiput broad, its margin feebly concave, nuchal collar absent.
MEASUREMENTS (mm) Holotype major: HW 0.72, HL 0.84, SL 0.40, EL 0.12, PW 0.34.
Paratype minor: HW 0.40, HL 0.46, SL 0.42, EL 0.06, PW 0.24.
COLOR Major: body medium reddish yellow, appendages plain medium yellow.
Minor: body dark yellow, appendages medium yellow.
RANGE Known only from the type locality.
BIOLOGY A male was with the type colony at the time of collection 9 August.

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Tambopata River, Madre de Dios (Stefan Cover and John E. Tobin). Scale bars = 1 mm.



Pheidole tambopatae **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *tambopatae,* after the region of the type locality.

DIAGNOSIS A medium-sized species, bicolorous in an odd pattern in both castes (see description below). Similar to *mincana,* but the **major** is rugoreticulate mesad to the eye and has an oval postpetiolar node; and both castes have smaller, more vertically directed propodeal spine and somewhat shorter pilosity.

See also the less similar *arhuaca, caulicola, chalca, chalcoides, meinerti, meinertopsis, schmalzi,* and *tragica.*

MEASUREMENTS (mm) Holotype major: HW 0.84, HL 0.92, SL 0.44, EL 0.10, PW 0.44.

Paratype minor: HW 0.44, HL 0.48, SL 0.42, EL 0.08, PW 0.30.

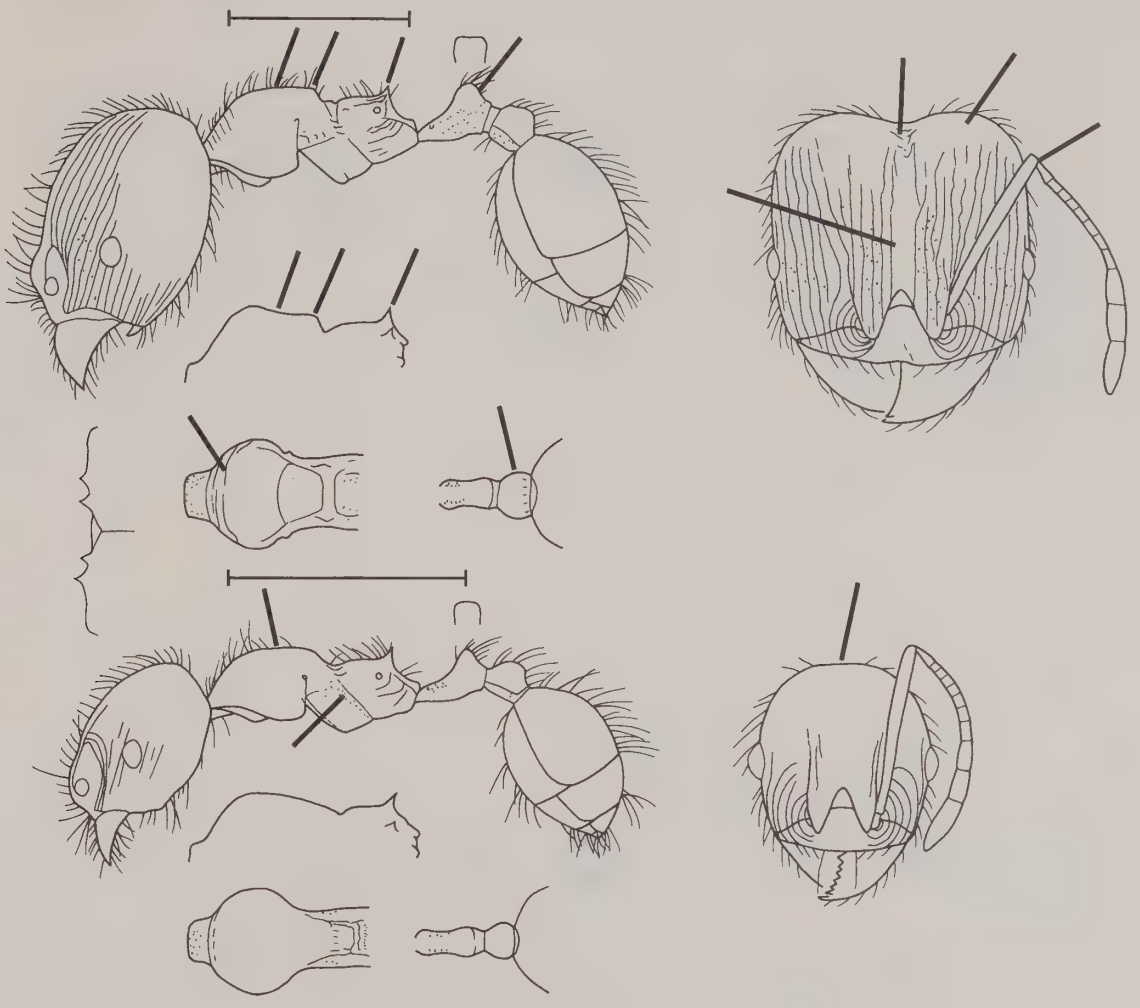
COLOR Major: occiput, dorsum of head capsule anterior to the eyes, side of the mesosoma, and all of the waist and appendages very light brown, rest of body medium to dark brown.

Minor: dorsum of head capsule anterior to the eyes, side of the mesosoma, all of the waist, and anterior two-thirds of the first gastral tergite light brown; all the rest of the body medium to dark brown.

RANGE Known from the type locality; from near Cali, Colombia; and from the Utinga Tract, near Belém, Pará, Brazil.

BIOLOGY The type colony was found beneath the bark of a tree in a treefall clearing. The Colombian colony was collected from a spiny bamboo *(Guadua)* grove.

FIGURE Upper: holotype, major. Lower: paratype, minor. ARGENTINA: 3 km northeast of Tafí del Valle, Tucumán, about 2200 m (W. L. Brown). Scale bars = 1 mm.

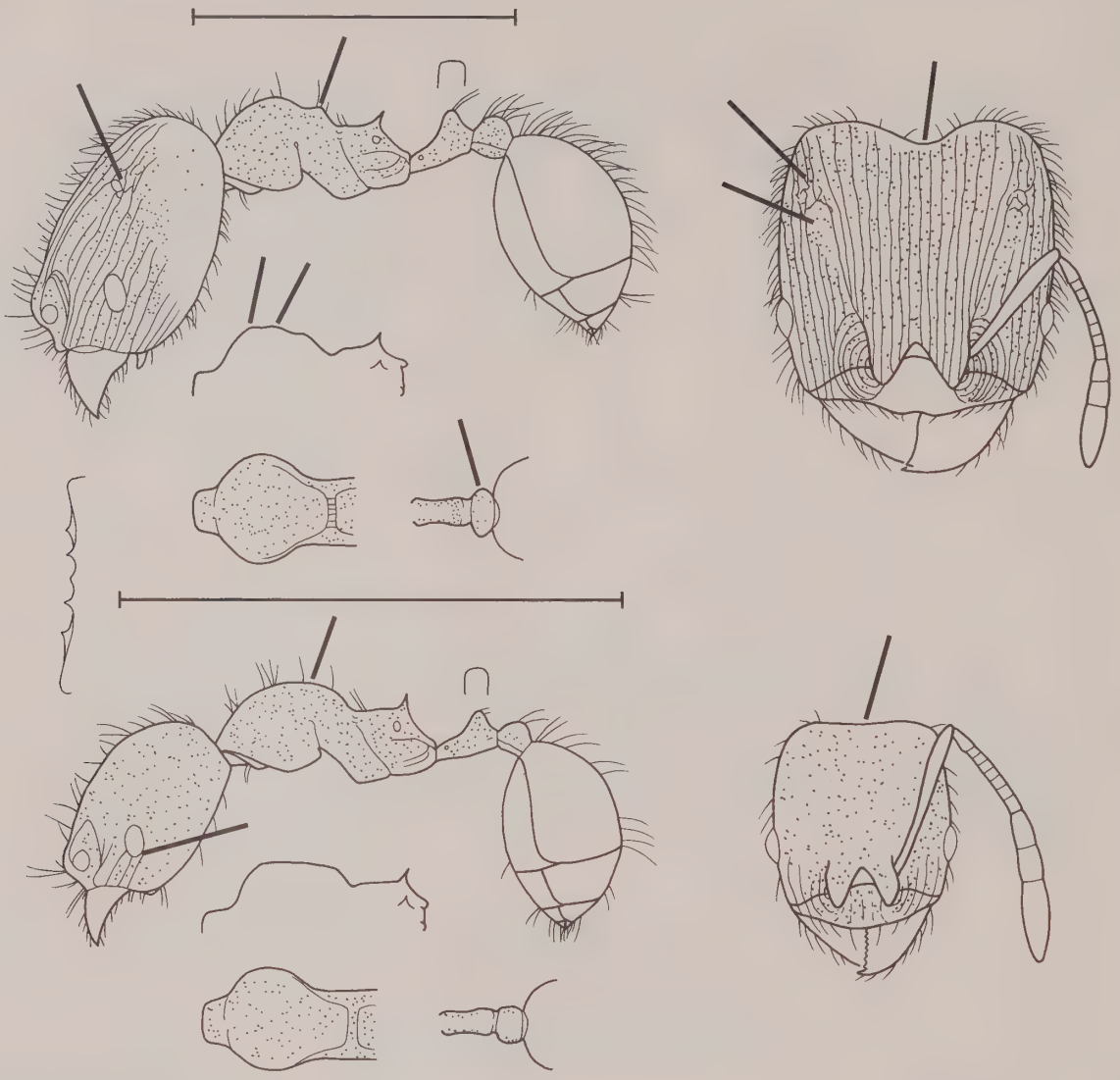


Pheidole tarchon **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after Tarchon, founder of Tarquinii and the Etruscan dodecapolis.
DIAGNOSIS Similar to *tetrica* and *victima,* distinguished as follows.
Major: brownish yellow; head covered by carinulae, except for occiput, the frontal triangle, strip behind the frontal triangle, and midclypeus; dorsal profile of promesonotum flat, dropping steeply to metanotum through a posterior face; head quadrate, Head Width equaling Head Length, antennal scape long, its tip touching the side of the head in full-face view two-thirds from eye to occipital corner; petiolar node in side view thick, with broad, semicircular apex; postpetiole from above bell-shaped; anterior fringe of pronotal dorsum carinulate, and mesosoma otherwise completely smooth and shiny.
Minor: promesonotal profile in side view flat; body almost completely smooth and shiny; antennal scape long; occiput moderately narrowed in full-face view but lacking nuchal collar.
MEASUREMENTS (mm) Holotype major: HW 1.22, HL 1.22, SL 0.82, EL 0.18, PW 0.52.
Paratype minor: HW 0.68, HL 0.72, SL 0.66, EL 0.14, PW 0.40.
COLOR Major and minor: concolorous brownish yellow.
RANGE Known only from the type locality.
BIOLOGY The type colony was collected in alder woods in a ravine; a winged queen was in the nest on 30 January.

Compare with *bruchella, charazana, kuna, micon, tillandsiarum*

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Pueblito to south boundary of Tayrona Park, Magdalena (C. Kugler). Scale bars = 1 mm.



Pheidole tayrona **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the Tayrona Park, in the region of origin.

DIAGNOSIS A small, medium-brown member of the *flavens* group with yellow appendages, marked in the **major** by distinct antennal scrobes with rugoreticulum confined to a small region just posterior to the scrobes.

Similar to *charazana* of Colombia but the major differs in its lack of rugoreticulum on the humerus, shorter head, and more prominent mesonotal convexity.

See also *bruchella, kuna, micon,* and *tillandsiarum*.

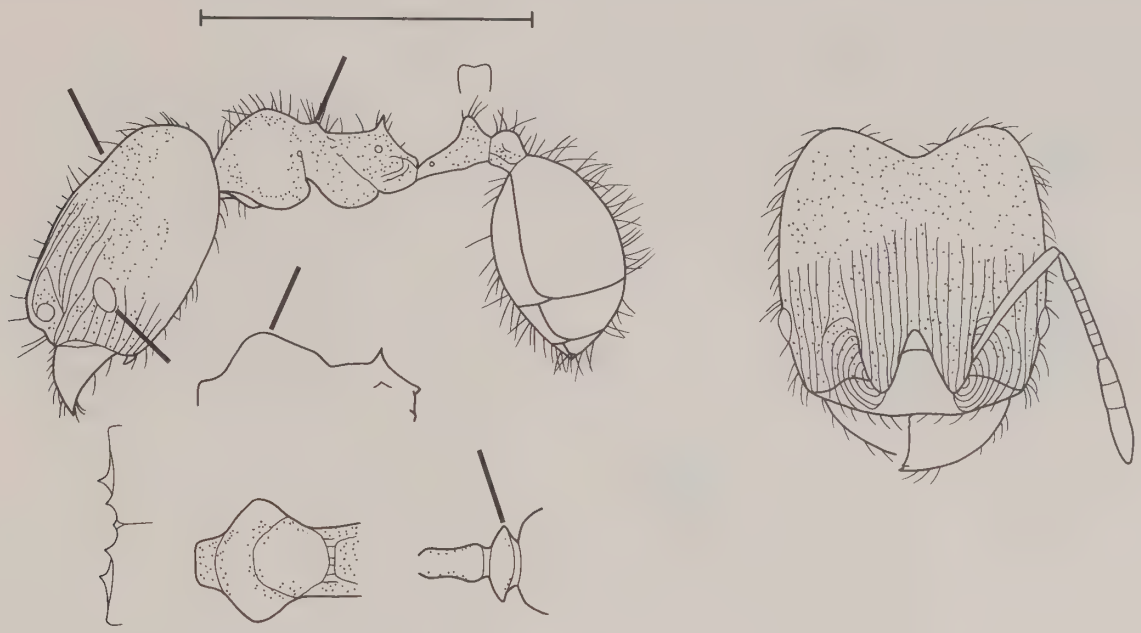
MEASUREMENTS (mm) Holotype major: HW 0.74, HL 0.80, SL 0.44, EL 0.12, PW 0.38.

COLOR Major and minor: body medium brown, appendages yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

FIGURE Unique holotype, major. MEXICO: Paraje Nuevo, Nacimiento, Cordoba, Veracruz (Stewart B. and Jarmila Kukalová-Peck). Minor: unknown. Scale bar = 1 mm.

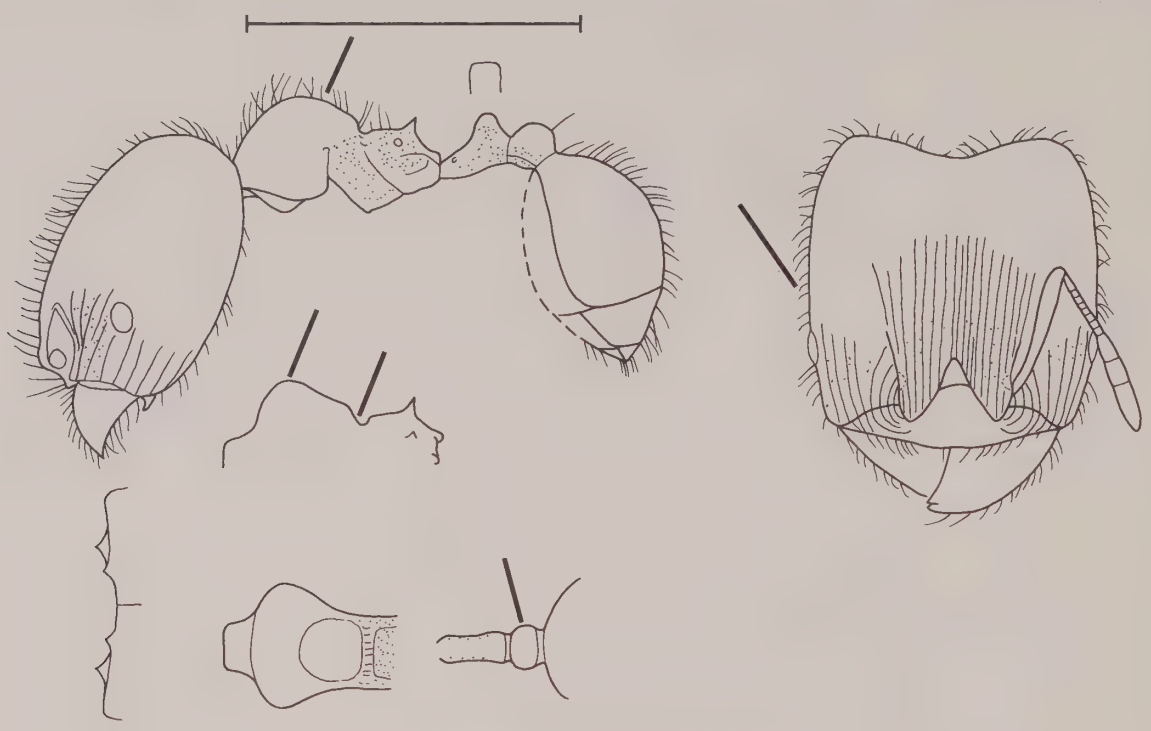


Pheidole tenebra **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *tenebra,* darkness.
DIAGNOSIS Similar in various traits to *cerina, hizemops, longinoi, mackayi, micon,* and *tachirana,* distinguished as follows.
Major: dark brown; medium sized; eyes set well forward in head; exceptionally wide, spinose postpetiole; slightly concave anterior dorsal cephalic border seen in profile; well-developed mesonotal convexity.
MEASUREMENTS (mm) Holotype major: HW 0.74, HL 0.80, SL 0.40, EL 0.12, PW 0.40.
COLOR Major: body and mandibles dark brown, legs and antennae dark yellow.
RANGE Known only from unique major holotype.
BIOLOGY The single specimen known was found in a berlese sample from tropical evergreen forest.

Compare with *arhuaca, flavifrons, minutula, nitidicollis*

FIGURE Unique holotype, major. TRINIDAD: Port of Spain (Roland Thaxter). Scale bar = 1 mm.



Pheidole tenerescens Wheeler

Pheidole tenerescens Wheeler 1922e: 7.

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Presumably from L *tener,* soft, alluding to the relatively feeble sculpture.

DIAGNOSIS As represented by the **major**, a small, yellow member of the *flavens* group with prominent, rounded humerus that rises well above the mesonotum in dorsal-oblique view; a nearly perfectly semicircular outline of promesonotum in side view; a deep, circular metanotal groove with vertical anterior propodeal face in dorsal-oblique view; short pilosity; and mostly smooth, shiny body. Similar to *nitidicollis,* but lacking a mesonotal convexity in side view, with shorter cephalic carinulae, smaller propodeal spiracle and spine, and yellow as opposed to medium brown gaster.

See also the less similar *arhuaca, flavifrons, minutula,* and other species listed as close to *arhuaca* (q.v.).

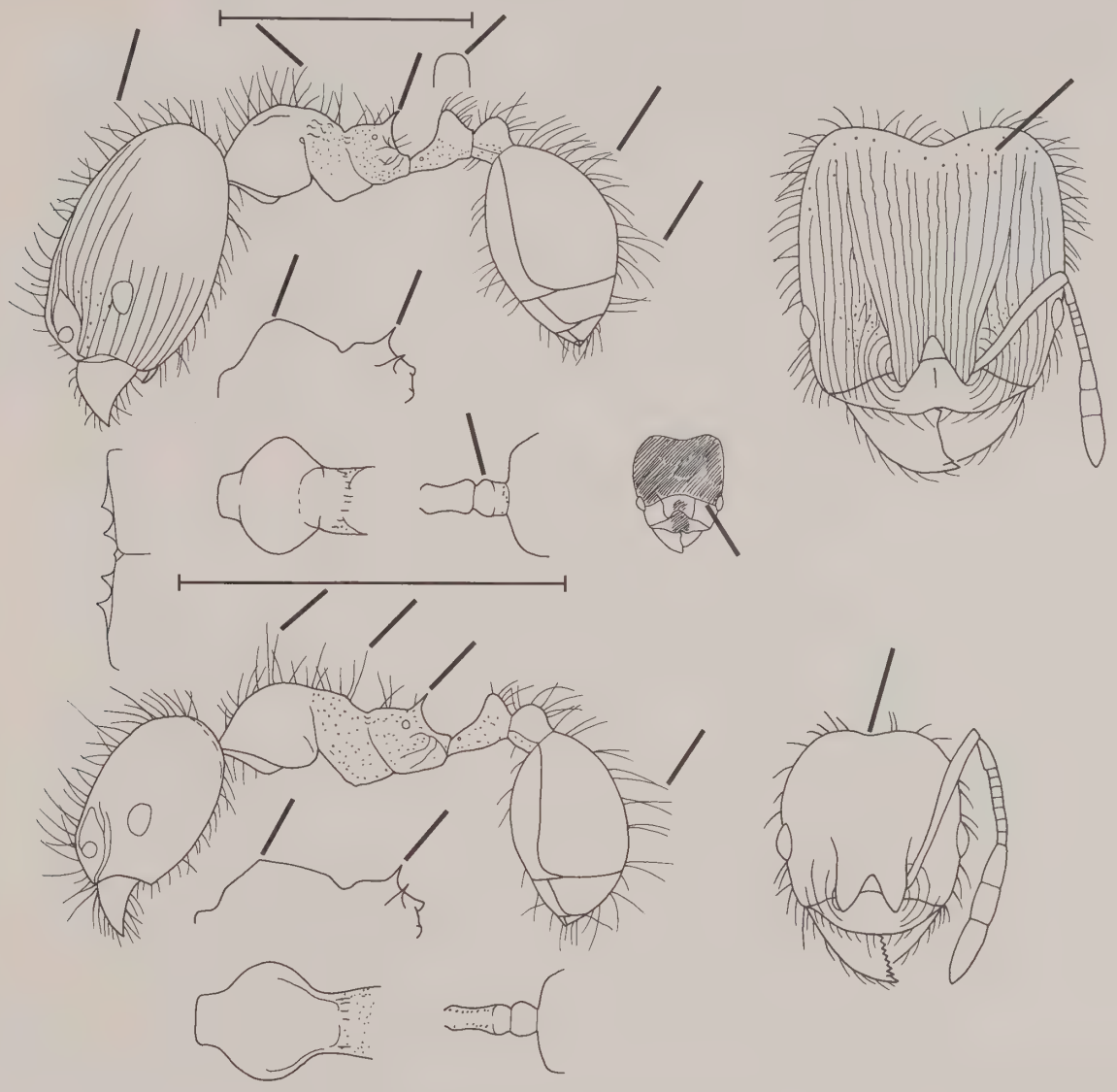
MEASUREMENTS (mm) Holotype major: HW 0.74, HL 0.80, SL 0.34, EL 0.10, PW 0.40.

COLOR Major: concolorous yellow.

RANGE Known only from the holotype major.

BIOLOGY Collected by sweeping vegetation (Roland Thaxter).

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (Leeanne E. Tennant-Alonso). Scale bars = 1 mm.

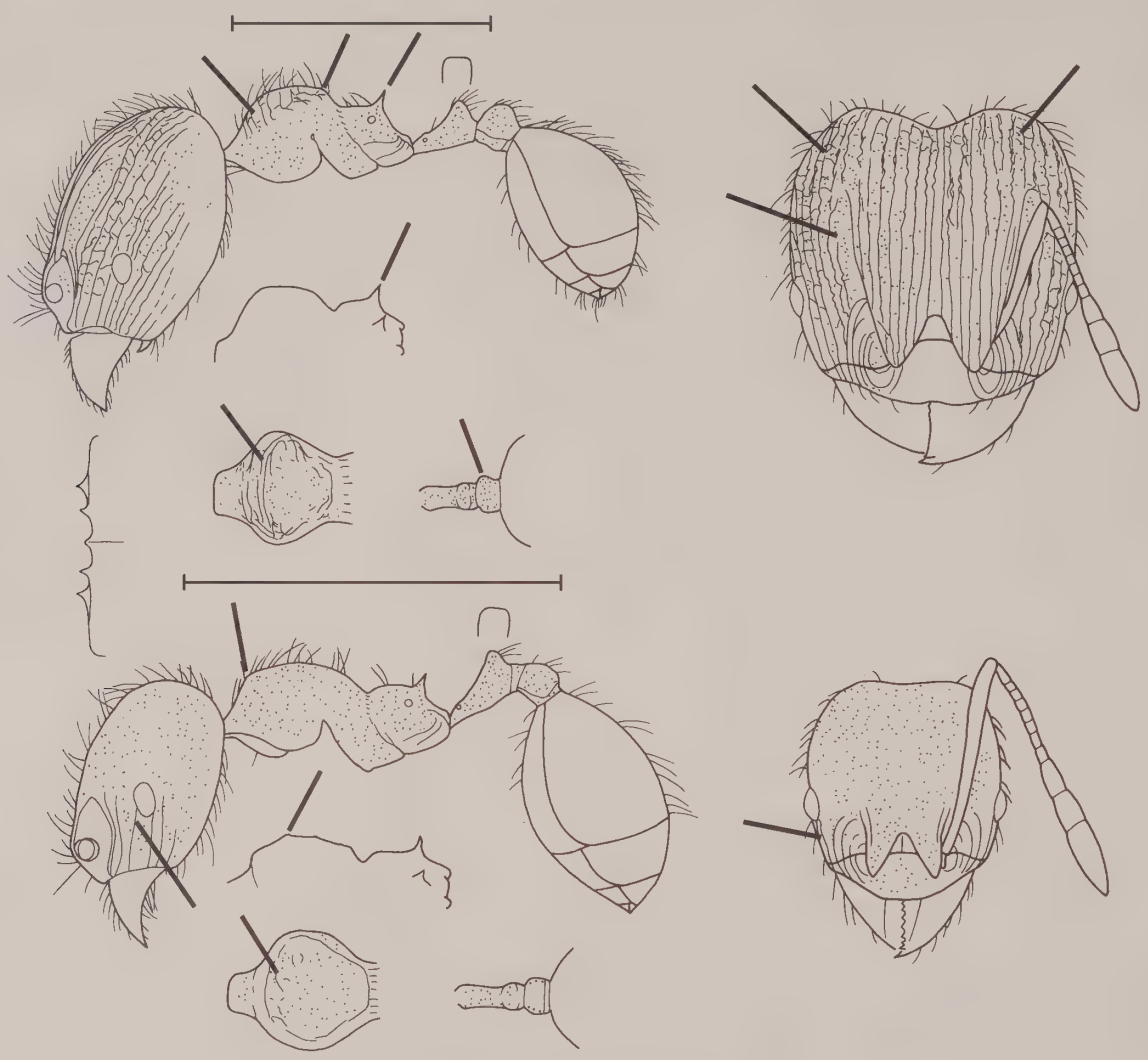


Pheidole tennantae **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the collector, Leeanne E. Tennant-Alonso, myrmecologist and conservationist.
DIAGNOSIS Similar in various traits to *amazonica, chalcoides, moffetti,* and *pariana,* differing as follows.
Major: brown, with bicolored head; pilosity dense, with many hairs 1.5–2.0× Eye Length; in dorsal-oblique view, humerus high, descends in continuous nearly flat curve to metanotum; propodeal spines half as long as propodeal basal face preceding them; from above, postpetiolar node oval and very narrow, only about as wide as petiolar node; dorsal surface of head carinulate except for occiput, frontal triangle, and mid-clypeus; occiput smooth with scattered foveae.
Minor: pilosity very long, some hairs 2× Eye Length; humerus in dorsal-oblique view angulate; propodeal spines moderately long, and thin; occiput narrowed somewhat, its margin concave, lacking nuchal collar.
MEASUREMENTS (mm) Holotype major: HW 0.86, HL 0.90, SL 0.46, EL 0.14, PW 0.44.
Paratype minor: HW 0.46, HL 0.50, SL 0.44, EL 0.10, PW 0.32.
COLOR Major: rear two-thirds of head, as well as frontal triangle, part of vertex, and midclypeus, dark brown and rest of head dark yellow, as depicted; waist light brown.
Minor: body dark brown; mandibles, funiculi, and tarsi medium yellow, remainder of appendages brownish yellow.
RANGE Atlantic lowlands of Costa Rica (J. T. Longino 1997); Panama; Colombia; Venezuela; and Amazonian Peru (Tingo Maria).
BIOLOGY In Costa Rica, according to Longino (1997), *tennantae* (referred to by the Wilson ms. name *campanae*) nests in dead wood on the floor of wet forests.

Compare with *ademonia, cardiella, infernalis, peltastes, sospes*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: São Leopoldo, Rio Grande do Sul. Scale bars = 1 mm.

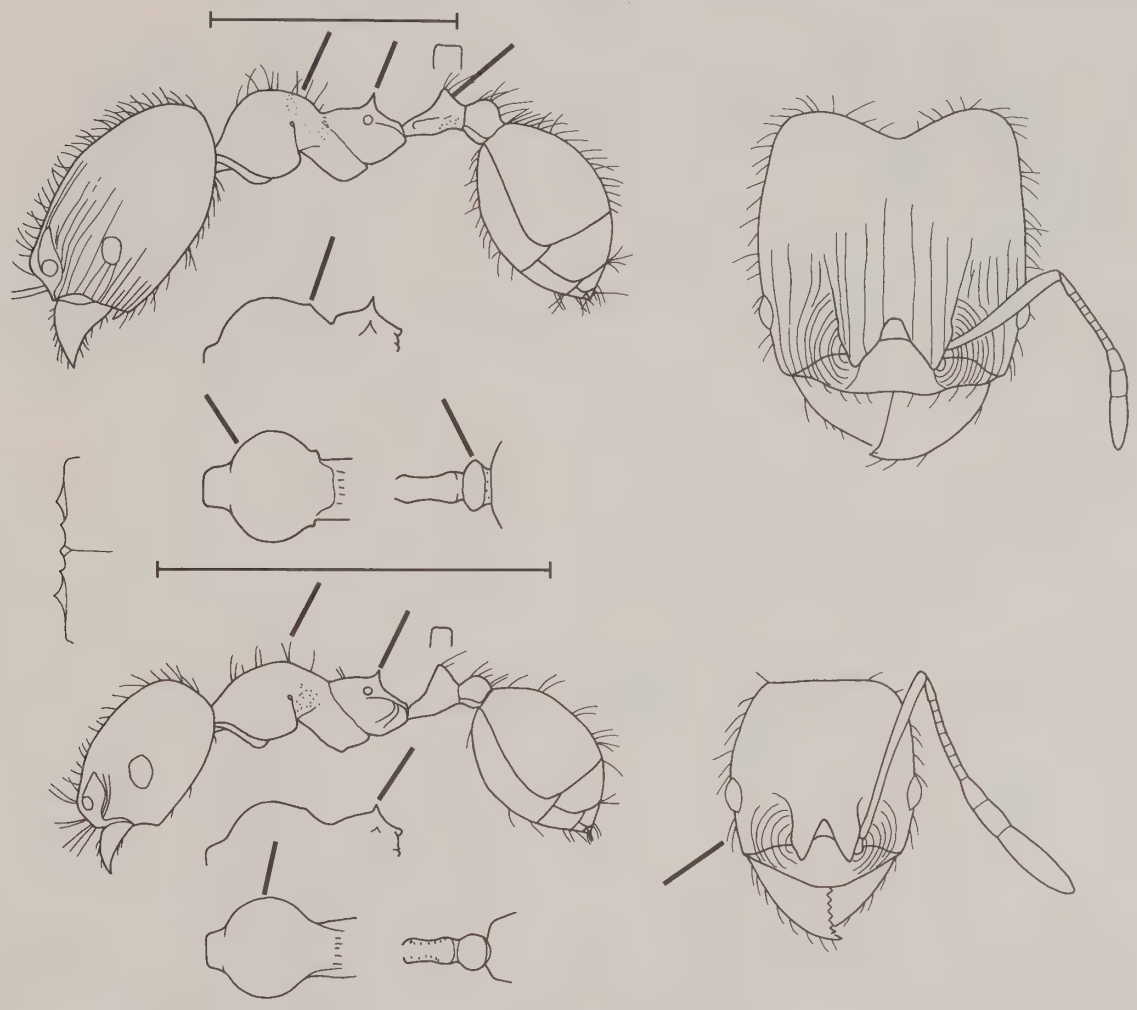


Pheidole termitobia Forel

Pheidole termitobia Forel 1901l: 390.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY Gr L *termitobia,* living with termites.
DIAGNOSIS A member of the *flavens* group, similar to species listed above in heading, and distinguished from them and other species of the group as follows.
Major: reddish yellow; occiput and sides of head rugoreticulate; vertex, frontal lobes, and genae carinulate; antennal scrobes present; all of head, mesosoma, and waist foveolate and opaque; humeri rugoreticulate, and anterior margin of pronotum transversely carinulate; propodeal spines strongly developed; postpetiole from above oval.
Minor: reddish yellow; all of head and mesosoma foveolate and opaque; carinulae of head reach eye level; humeri subangulate.
MEASUREMENTS (mm) Lectotype major: HW 0.84, HL 0.84, SL 0.52, EL 0.10, PW 0.42.
Paralectotype minor: HW 0.42, HL 0.46, SL 0.42, EL 0.06, PW 0.32.
COLOR Major and minor: light reddish yellow, appendages clear yellow.
RANGE Known only from the type locality.
BIOLOGY Forel records the types, transmitted to him by Erich Wasmann, as discovered "chez les termites," with no further details.

FIGURE Upper: major. Lower: minor. DOMINICAN REPUBLIC: Hotel Nueva Sueza, Constanza, La Vega Province, 1300 m (William L. and Doris E. Brown). (Type locality: Diquini, Haiti). Scale bars = 1 mm.



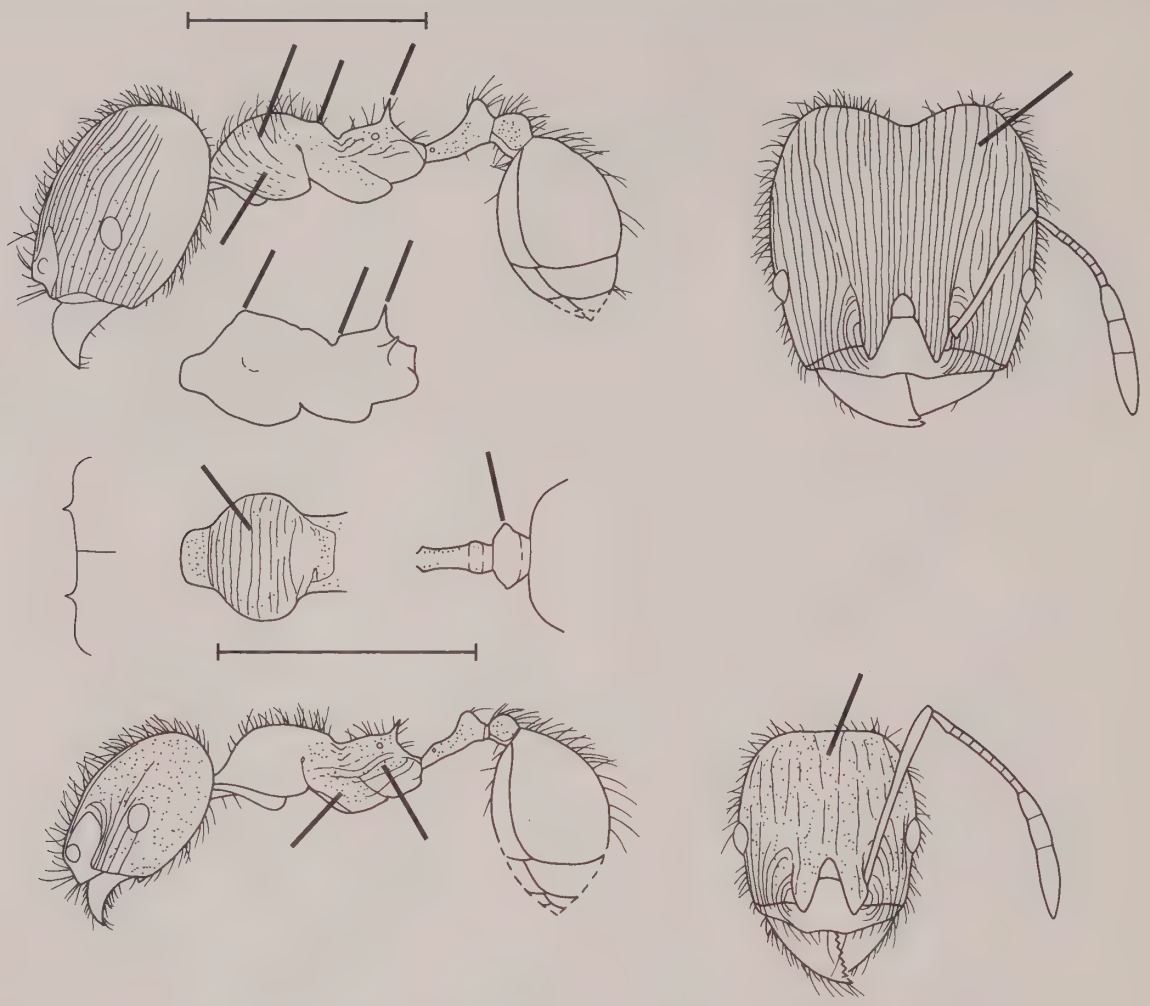
Pheidole terresi Wheeler and Mann

Pheidole terresi Wheeler and Mann 1914: 22. Syn.: *Pheidole terresi* var. *illota* Wheeler and Mann 1914: 23, n. syn.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after J. B. Terres, one of William M. Mann's hosts in Haiti.
DIAGNOSIS A medium-sized, concolorous yellow member of the *flavens* group distinguished in both **major** and **minor** by the almost complete absence of sculpturing over the entire body (which is thus smooth and shiny), except for longitudinal carinulae on the anterior half of the head capsule. Further, in the **major**: a weakly developed but distinct mesonotal convexity in dorsal-oblique view, petiolar node triangular in side view, postpetiolar node subangulate from above.
Minor: pilosity sparse and short, propodeal spine shaped like an equilateral triangle.
Similar species: *amabilis, boliviana, melastomae, mixteca, scitula,* and especially *crinita* and *similigena*.
MEASUREMENTS (mm) Lectotype major: HW 0.84, HL 0.90, SL 0.42, EL 0.08, PW 0.40.
Paralectotype minor: HW 0.38, HL 0.44, SL 0.38, EL 0.06, PW 0.24.
COLOR Major: concolorous clear medium yellow, except for gaster and appendages, which are light yellow.
Minor: concolorous pale yellow.
RANGE Hispaniola, recorded from both Haiti and the Dominican Republic, within 800–1600 m. An apparent endemic.
BIOLOGY In Haiti, the type colonies were recorded as nesting in soil (W. M. Mann), while in the Dominican Republic, the Constanza colony was found beneath a rock in a pine-hardwood forested ravine (W. L. and D. E. Brown).

Compare with *tarchon, victima*

FIGURE Upper: syntype, major. Lower: syntype, minor. BRAZIL: Ibirama, Santa Catarina. Scale bars = 1 mm.

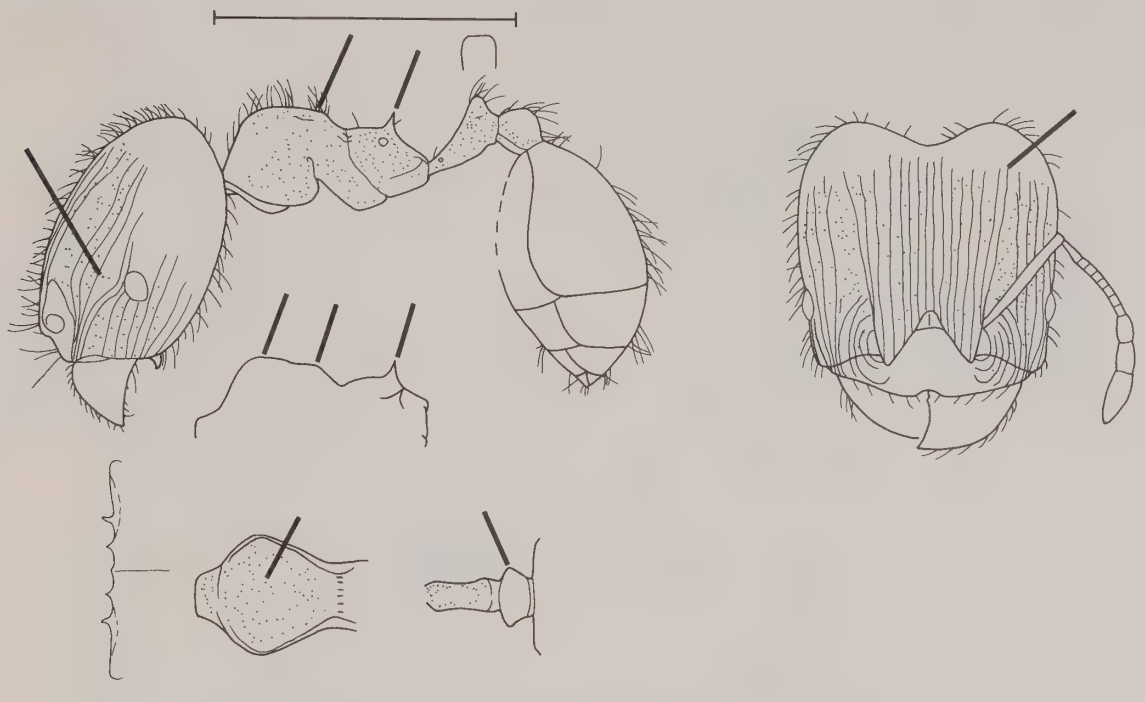


Pheidole tetrica Forel

Pheidole tetrica Forel 1913m: 226.

TYPES Mus. Hist. Nat. Genève; Mus. Comp. Zool. Harvard.
ETYMOLOGY L *tetrica,* harsh, forbidding, allusion unknown.
DIAGNOSIS Similar in various traits to *tarchon* and *victima,* differing as follows.
Major: dorsal surface of head, except for frontal triangle and midclypeus, completely covered with carinulae; pronotum covered by "wraparound" carinulae that circle the dorsum to travel along the lower lateral margin; in dorsal-oblique view propodeum descends anteriorly to metanotal groove through a steep face; propodeal spine almost half as long as propodeal basal face and almost vertical to it; postpetiole from above bluntly spinose.
Minor: widely spaced carinulae cover almost all the dorsal surface of the head, including occiput; center of mesopleuron and center of side of propodeum with longitudinal carinulae; occiput broad, lacking nuchal collar.
MEASUREMENTS (mm) Holotype major: HW 1.08, HL 1.10, SL 0.62, EL 0.16, PW 0.52.
Paratype minor: HW 0.52, HL 0.62, SL 0.64, EL 0.12, PW 0.40.
COLOR Major: concolorous yellow with faint reddish tinge.
Minor: concolorous yellow.
RANGE Recorded from Santa Catarina and São Paulo, Brazil (Kempf 1972b).
BIOLOGY Unknown.

FIGURE Lectotype, major. MEXICO: Mirador, Veracruz (Elisabeth Skwarra). (Minor not seen.) Scale bar = 1 mm.



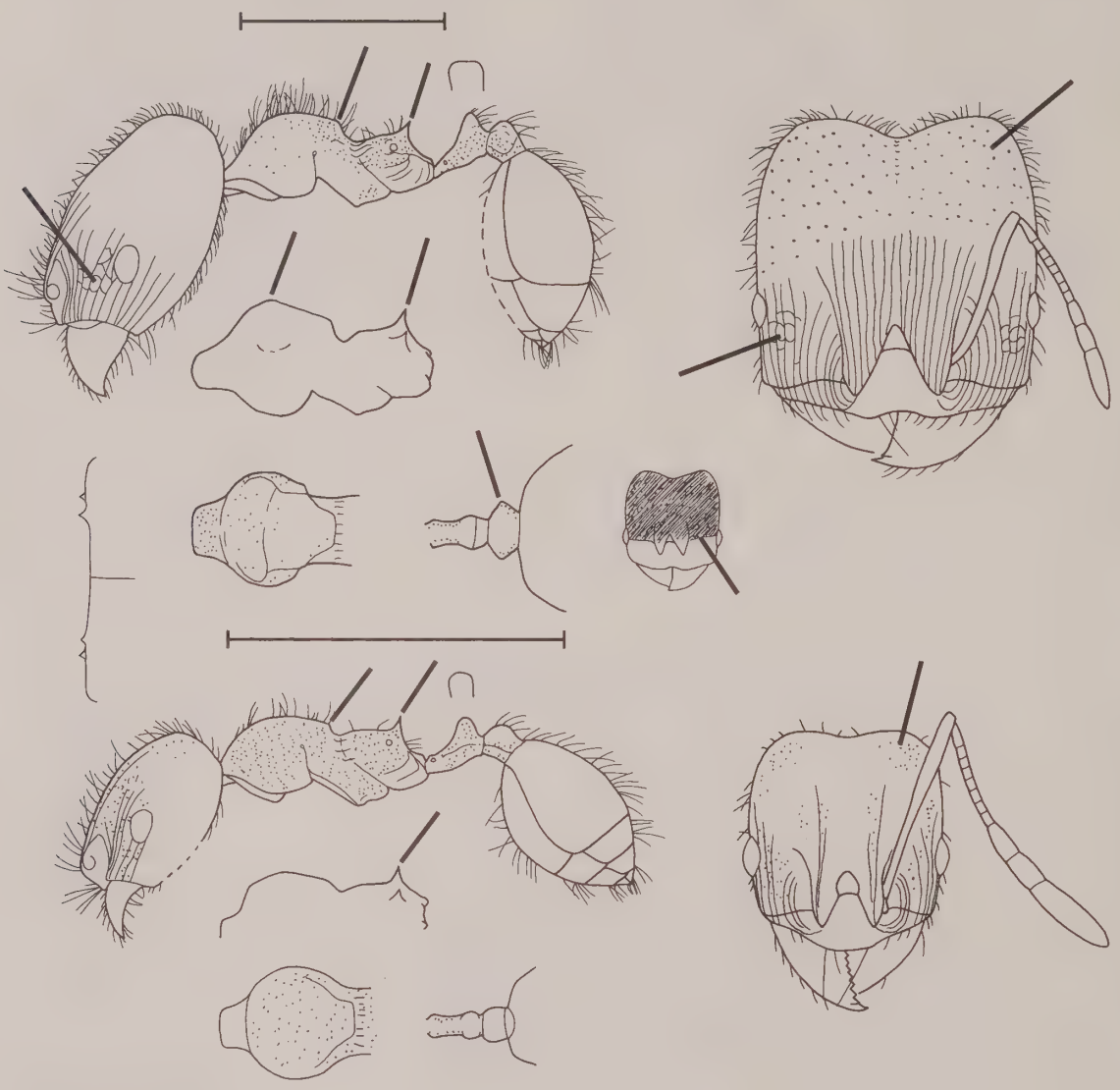
Pheidole tillandsiarum Wheeler, **new status**

Pheidole floridana var. *tillandsiarum* Wheeler 1934g: 166.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *tillandsiarum,* belonging to tillandsias (bromeliad epiphytes).
DIAGNOSIS Similar in various details to *amabilis, arhuaca, citrina, crinita, delicata, floridana, hedlundorum, mallota, melastomae, nitidicollis, similigena,* and *terresi,* differing as follows.
Major: yellow; occipital lobes smooth and shiny, and most of rest of head carinulate and sparsely foveolate; carinulate immediately mesad to eye curve forward (in side view) to travel to the anterior genal border; mesonotal convexity present but rudimentary; entire mesosoma foveolate; postpetiole from above trapezoidal.
MEASUREMENTS (mm) Lectotype major: HW 0.86, HL 0.90, SL 0.44, EL 0.12, PW 0.40.
COLOR Major: medium yellow with reddish overtone except for appendages and gaster, which are plain medium yellow.
RANGE Known only from the type locality.
BIOLOGY The type colony was collected from an epiphyte *(Tillandsia streptophylla)*.

Compare with species listed in the Diagnosis below

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. MEXICO: Pedregal, near Mexico City (Elisabeth Skwarra). Scale bars = 1 mm.

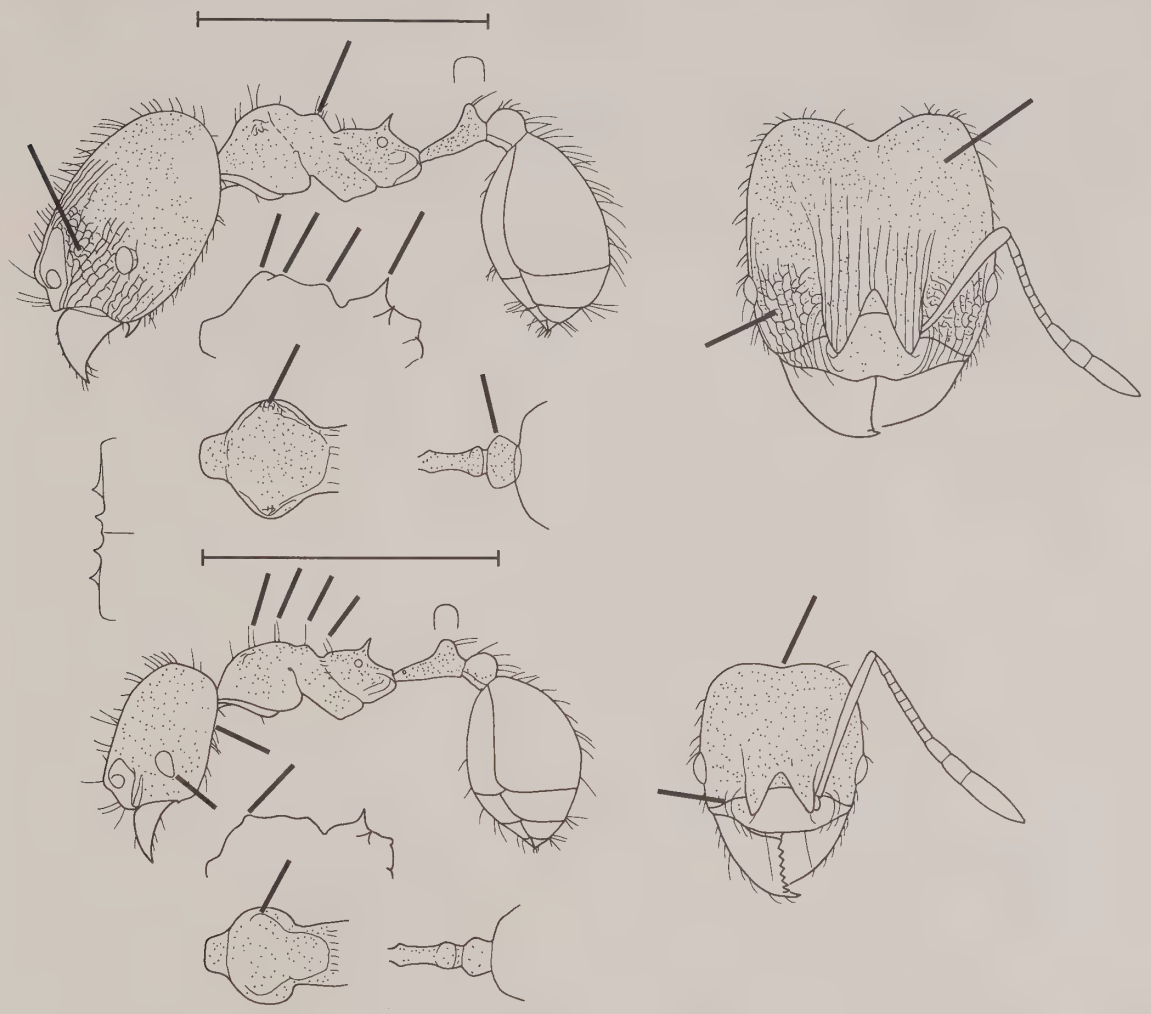


Pheidole tragica Wheeler

Pheidole tragica Wheeler 1934g: 167.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *tragicus,* pertaining to tragedy, significance unknown.
DIAGNOSIS A somewhat larger brown species, whose **major** has a bicolorous head, rugoreticulum mesad to the eye, conspicuous foveae scattered over the otherwise smooth posterior half of the dorsal head capsule, and cornulate postpetiole. The mesonotum of the **major** and **minor** has no dorsal convexity, and its posterior face descends abruptly to the metanotum.
Somewhat similar to *arhuaca, caulicola, chalca, chalcoides, mixteca,* and *scabriventris,* but easily distinguished by combinations of many or all of the above traits.
MEASUREMENTS (mm) Lectotype major: HW 1.04, HL 1.20, SL 0.60, EL 0.18, PW 0.56.
Paralectotype minor: HW 0.54, HL 0.58, SL 0.50, EL 0.12, PW 0.34.
COLOR Major: head bicolorous, with anterior third brownish yellow and posterior two-thirds medium brown; rest of body concolorous medium brown.
Minor: body concolorous medium brown.
RANGE Known only from the type series.
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. TRINIDAD: Bridge 1/7, east of Valencia, St. Andrew Parish (Stefan Cover). Scale bars = 1 mm.



Pheidole trinitatis **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the country from which the type specimens originated.

DIAGNOSIS Similar to *exigua, flavens, moerens, nitidicollis, nuculiceps, orbica, pholeops,* and *sculptior,* distinguished as follows.

Major: reddish yellow, with brown gaster; rugoreticulum fills space between eyes, antennal fossa, and anterior head border on each side of head; very small patch of rugoreticulum on humerus; carinulae of frontal lobes extend posteriorly only to midpoint of head; all of head and body except gaster foveolate and opaque; mesonotal convexity well-developed; pronotal profile in dorsal-oblique view feebly bilobate; postpetiole from above diamond-shaped; pilosity sparse.

Minor: ventral profile of head in side view feebly concave; eyes set well forward on head and slightly tapered anteriorly; humerus dentate in dorsal-oblique view; all of body except gaster foveolate and opaque, and carinulae limited to antennal fossae; mesosomal pilosity sparse, consisting at least partly of widely spaced pairs of setae.

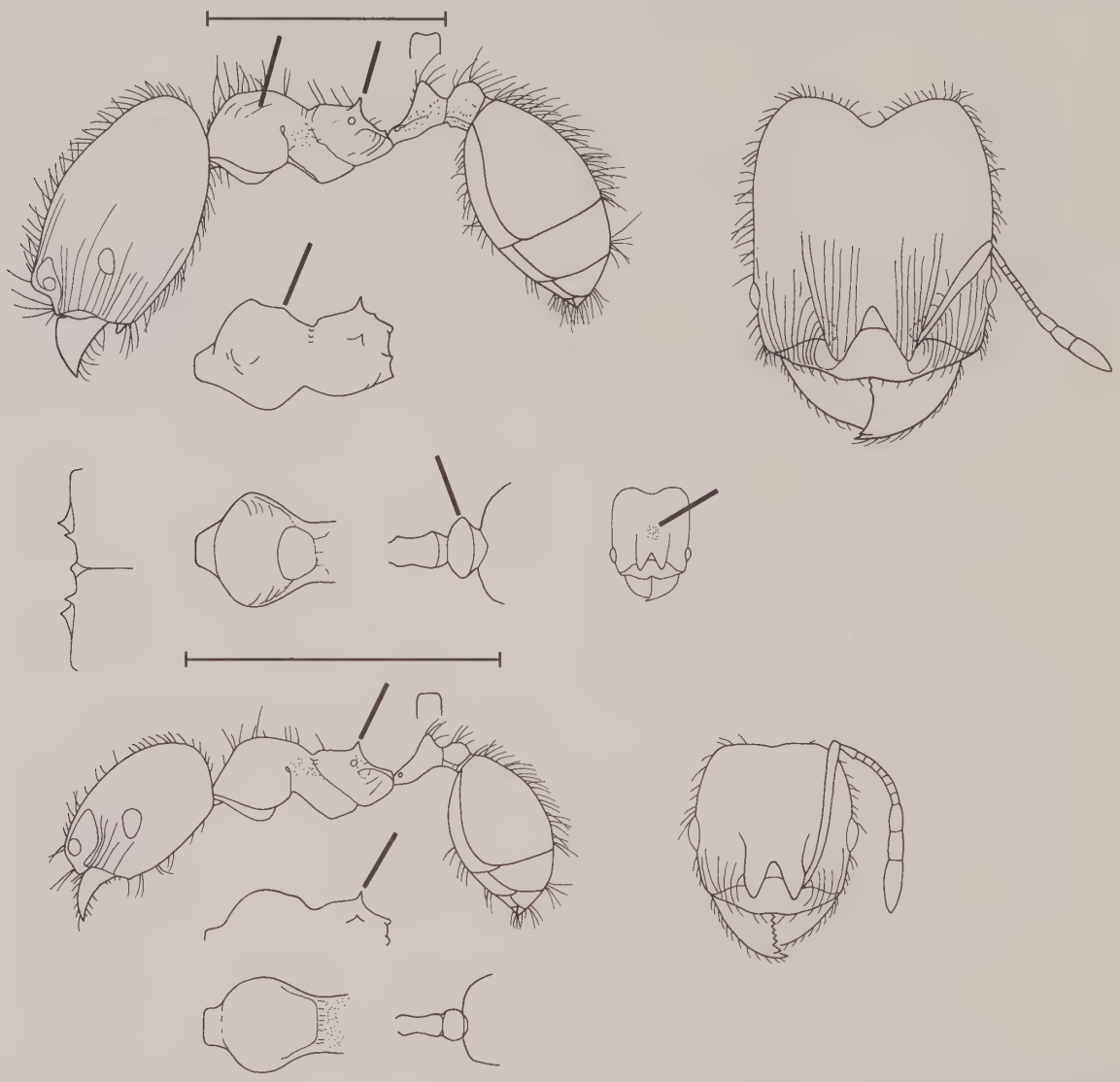
MEASUREMENTS (mm) Holotype major: HW 0.90, HL 0.54, SL 0.48, EL 0.10, PW 0.44.
Paratype minor: HW 0.46, HL 0.50, SL 0.44, EL 0.06, PW 0.30.

COLOR Major: body appendages medium reddish yellow ("orange") except for gaster, which is plain medium brown.
Minor: concolorous light reddish yellow ("light orange").

RANGE Known from the type locality, and from the Arena Forest Reserve, St. Andrew Co., Trinidad.

BIOLOGY The type colony was found in a floodplain forest, nesting in a dead twig; and the Arena Forest Reserve colony was in secondary lowland rainforest, in a hollow fruit buried in sandy soil.

FIGURE Upper: major. Lower: minor. TENNESSEE: Great Smoky Mountains National Park. (Type locality: at base of Mt. Mitchell, North Carolina, collected by Auguste Forel.) Scale bars = 1 mm.



Pheidole tysoni Forel

Pheidole tysoni Forel 1901j: 348.

TYPES Mus. Hist. Nat. Genève.

ETYMOLOGY Named after "M. Tyson," whose farm was near the type locality.

DIAGNOSIS A medium-sized yellow member of the *flavens* group distinguished by the nearly complete absence of sculpturing on the body, except for longitudinal carinulae on the anterior half of the head capsule of the **major** and **minor**, short and faint carinulae on the humerus of the **major**, and small patches of foveolae on the waist (**major**) or propodeal dorsum (**minor**). Propodeal spine short and suberect in both castes. Postpetiolar node of **major** broad and oval. Vertex of **major** (center of dorsum of head) with a faint circular brown spot.

Similar to *amabilis, boliviana, melastomae, mixteca, scitula,* and especially *terresi* of Hispaniola. Most easily distinguished from the often sympatric *Pheidole bicarinata* by the absence of sculpture on the sides of the propodeum in the minor. In *bicarinata* minors these are foveolate.

MEASUREMENTS (mm) Major (figured specimen above): HW 0.94, HL 1.10, SL 0.44, EL 0.12, PW 0.48.
Minor (figured specimen above): HW 0.44, HL 0.48, SL 0.42, EL 0.06, PW 0.28.

COLOR Major and minor: concolorous clear medium yellow.
Minor head with a slightly reddish tinge.

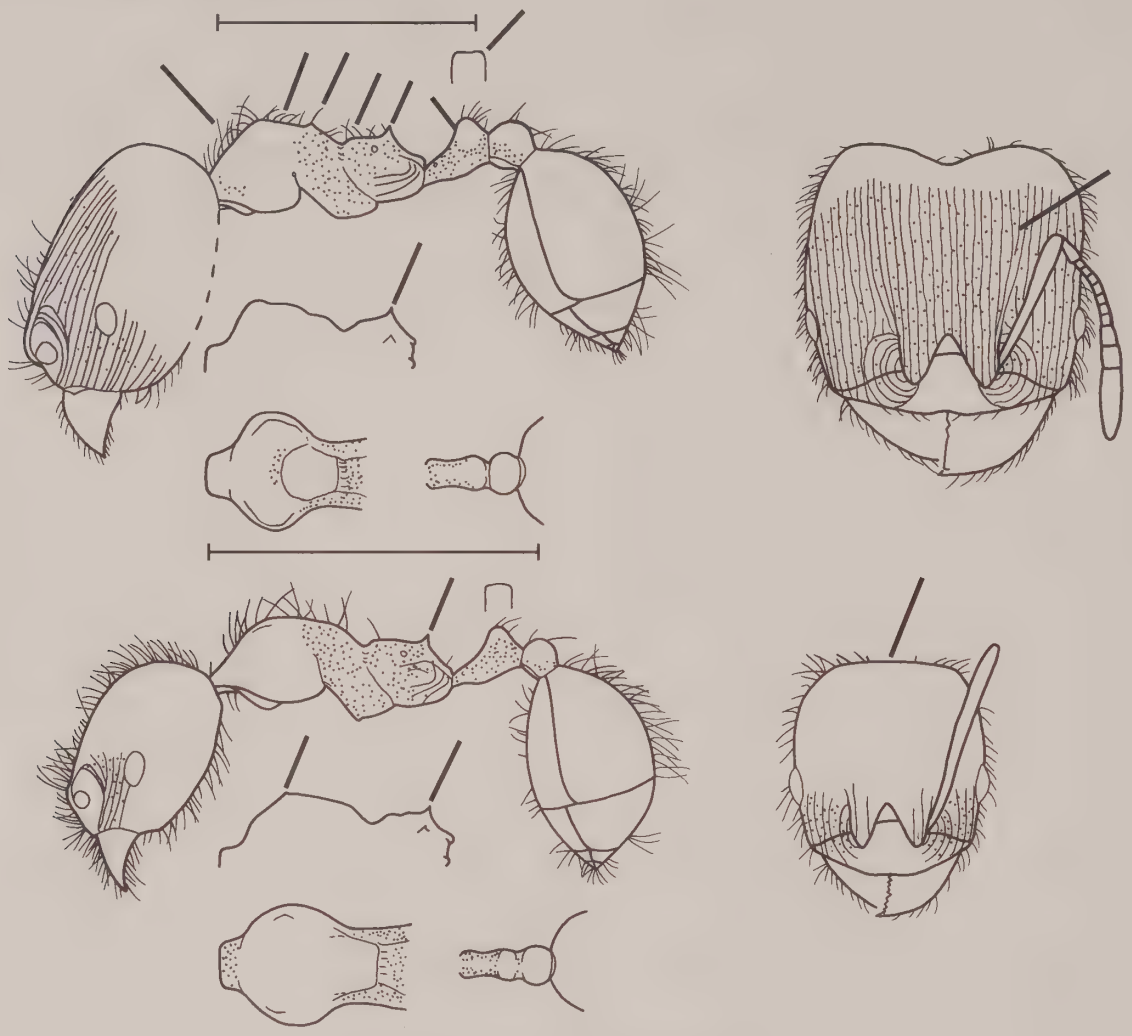
RANGE *P. tysoni* appears to have a disjunct distribution. I have seen material from New York south to extreme northwest Georgia (Clayton, Rabun Co.) and westward through Tennessee and Kentucky to Barry Co., Kentucky. Stefan Cover has collected it in the Davis Mts. of western Texas at 1800 m, and at 1400–1800 m in the mountains of southern Arizona. Moody and Francke (1982) record a single colony found at 950 m in Hale Co., western Texas. Single series are recorded from near Juárez, Chihuahua, Mexico, and New

Liberia, Louisiana, by William MacKay. The latter two records are somewhat anomalous in view of the otherwise montane and cool-temperate range of the species.

BIOLOGY In New York, Stefan Cover (unpublished field notes) encountered colonies of *tysoni* in pure sandy soil of the Suffolk Co. pine barrens; in New York City, itself, he found a colony in the clayey soil of a residential lawn. In southern Arizona, he encountered the species in open woodlands variously composed of combinations of oak and juniper, usually with a grassy cover; nests were usually in the shade, either under stones or in open soil with or without craters of excavated earth. The soil varied from loam to fine sand. A nest Cover found in the Davis Mts. of Texas was beneath a stone in open oak-juniper-pinyon woodland. In Hale Co., Texas, Moody and Francke (1982) found a colony in the open ground of a vacant lot, the entrance surrounded by a 55-mm-wide tumulus of excavated soil. According to Cover, seeds are occasionally found in the nest, and workers tend aphids and collect floral nectar on low, herbaceous plants.

Compare with *delicata,*
also *alticola, chalca, hazenae*

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Braulio Carillo National Park, Heredia, 500 m (J. T. Longino). Scale bars = 1 mm.



Pheidole ulothrix **new species**

TYPES INBio.

ETYMOLOGY Gr *ulothrix,* woolly haired, referring to the hairs on the mesosomal dorsum.

DIAGNOSIS A medium-sized light brown (**major**) to yellow (**minor**) species distinguished in the **major** by curved, subrecumbent hairs (hence "woolly" hairs) all along the mesosomal dorsum; longitudinal carinulae covering all of the head except the occiput, mid-clypeus, and frontal triangle; lack of rugoreticulum anywhere; and broadly oval postpetiolar node.

Similar to *delicata,* but *delicata* has longer pilosity, none of which is "woolly," shorter propodeal spines, narrow petiolar node apex, and other details in body form, sculpturing, and pilosity as shown.

See also the less similar *alticola, chalca,* and *hazenae.*

MEASUREMENTS (mm) Holotype major: HW 0.98, HL 0.96, SL 0.58, EL 0.12, PW 0.46.

Minor: HW 0.50, HL 0.54, SL 0.54, EL 0.10, PW 0.30.

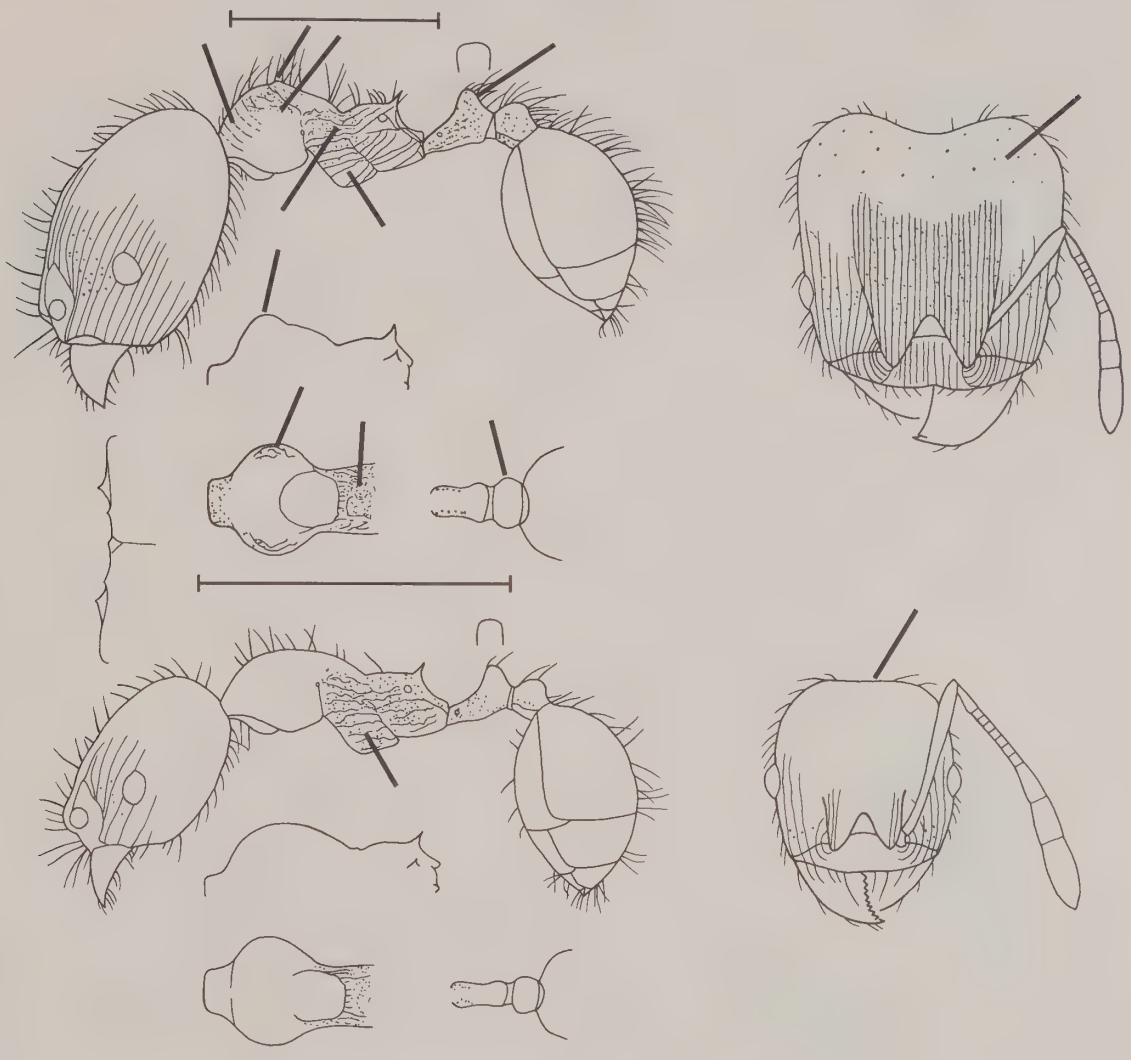
COLOR Major: gaster light brown; rest of body, as well as appendages, medium to dark yellow.

Minor: gaster brownish yellow, rest of body medium yellow, appendages light yellow.

RANGE Atlantic slope of Costa Rica (J. T. Longino 1997).

BIOLOGY Inhabits wet forest (Longino 1997).

FIGURE Upper: holotype, major. Lower: paratype, minor. PANAMA: Boquete, near Vulcan Baru, Chiriqui Province, 8°47′N 82°26′W (Gary J. Umphrey). Scale bars = 1 mm.



Pheidole umphreyi **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the collector, the field biologist and systematist Gary J. Umphrey.

DIAGNOSIS Similar in various traits to *chalcoides, mackayi, tennantae,* and several species close to them (q.v.), differing as follows.

Major: dark brown with bicolored head (see Color below); upper mesopleuron (anepisterum), dorsum of propodeum, and humerus covered by irregular, broken rugulae; lower mesopleuron (katepisterum), sides of propodeum, and most of anterior dorsal surface of head carinulate; middle of promesonotal dorsum in profile with a small, obliquely subangulate convexity; petiolar node in side view tapered toward apex; postpetiolar node from above oval.

Minor: mesopleuron and side of propodeum rugulose; most of head and all of pronotum smooth and shiny; occiput broad, its margin straight.

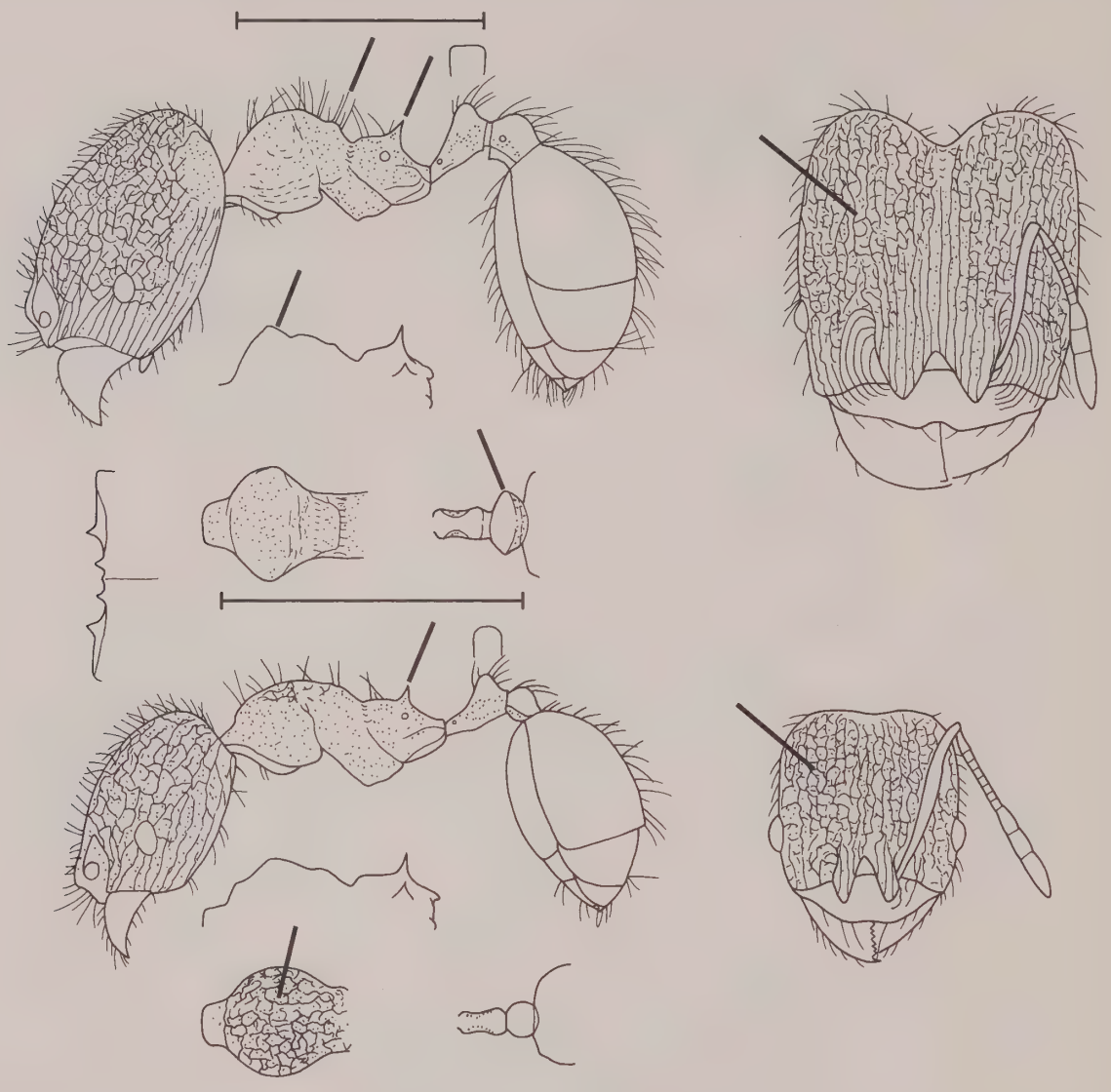
MEASUREMENTS (mm) Holotype major: HW 1.08, HL 1.08, SL 0.62, EL 0.12, PW 0.52.
Paratype minor: HW 0.56, HL 0.62, SL 0.56, EL 0.06, PW 0.36.

COLOR Major: body dark brown; head bicolored: strip of head capsule anterior to anterior margin of eyes brownish yellow, rest of capsule dark brown; appendages medium brown.
Minor: body blackish brown; head bicolored: narrow strip of the anterior half of head capsule between eye and anterior head capsule border a contrasting brownish yellow.

RANGE Known only from the type locality.

BIOLOGY The type colony was found by Gary J. Umphrey in a coffee plantation, nesting under the bark and in the still-firm rotting wood of a very large log. Winged queens were present at the time of collection 15 June.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: 4 km north-northwest of Las Alturas, Puntarenas, 8°59′N 82°51′W, 1950 m (P. S. Ward). Scale bars = 1 mm.



Pheidole verricula **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *verriculum,* a dragnet, referring to the densely rugoreticulate heads of the major and minor.

DIAGNOSIS A relatively large member of the *flavens* group, distinguished in both **major** and **minor** by the dorsal surface of the head being completely rugoreticulate except for the frontal lobes, clypeus, and a small strip of the head capsule just behind the clypeus. In addition, the **major** has a cornulate humerus and stout, relatively long propodeal spine, and a broad lens-shaped postpetiolar node, and the pronotal dorsum of the minor is completely rugoreticulate.

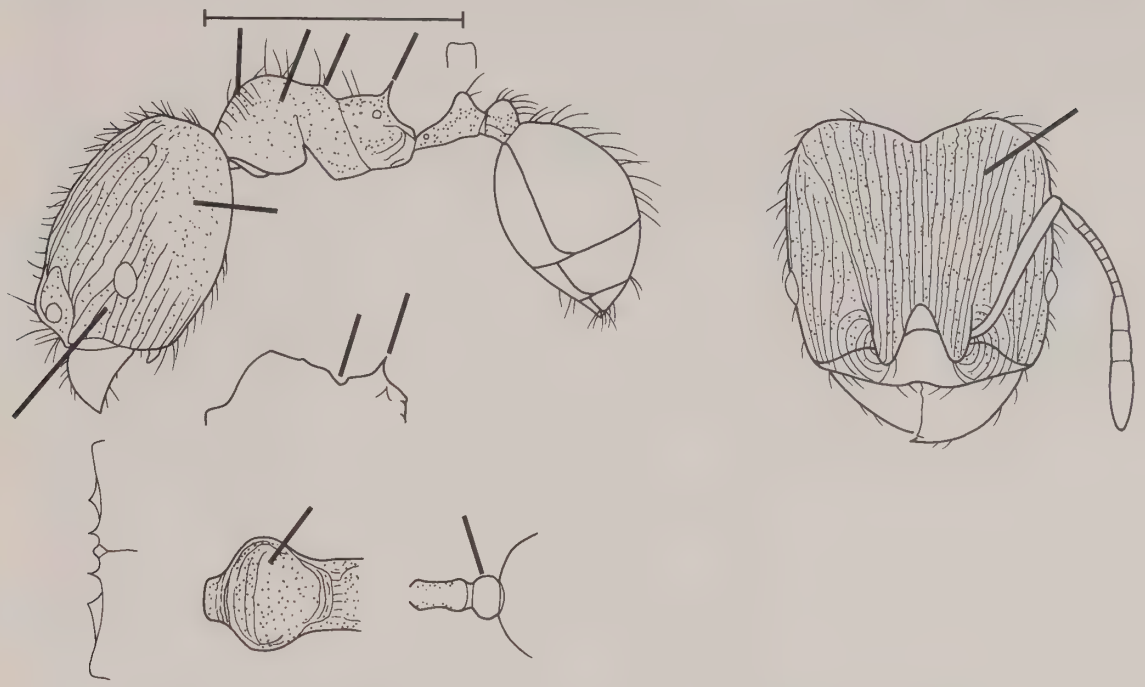
MEASUREMENTS (mm) Holotype major: HW 0.90, HL 1.00, SL 0.46, EL 0.12, PW 0.46.
Paratype minor: HW 0.48, HL 0.54, SL 0.46, EL 0.08, PW 0.32.

COLOR Major: body dark, almost blackish brown, mandibles medium brown, appendages a contrasting dark yellow.
Minor: mandibles and body concolorous medium brown, legs and antennae brownish yellow.

RANGE Montane Costa Rica above 1500 m, collected at Los Alturas, Braulio Carrillo, and Monteverde by Longino (1997); also Minas Las Animas, above Valle de Angeles, Honduras, 1560 m (W. L. Brown).

BIOLOGY Occurs on the leaf litter on the forest floor and in canopy soil in very wet cloud forest and elfin forest (Longino 1997). The Honduras colony found by W. L. Brown was in a forest ravine, nesting in rotten wood.

FIGURE Lectotype, major. BRAZIL: Rio Negro, Paraná. Minor unknown. Scale bar = 1 mm.



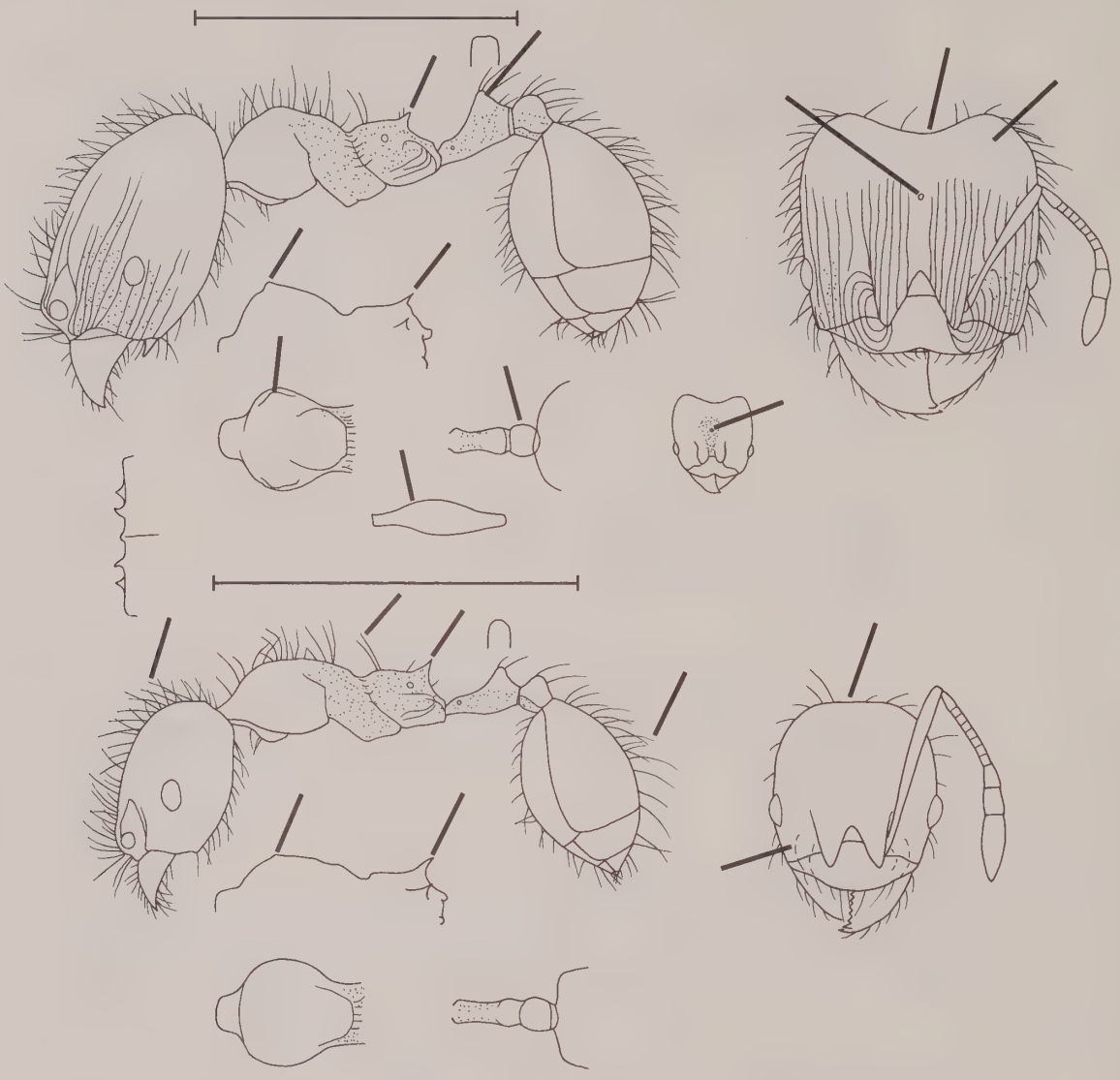
Pheidole victima Santschi, **new status**

Pheidole lignicola var. *victima* Santschi 1929d: 290.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY Unknown.
DIAGNOSIS Similar to *tarchon* and *tetrica,* differing as follows.
Major: dark reddish-yellow; all of dorsal surface of head, including occiput but excluding frontal triangle and midclypeus, carinulate; carinulae originating on frontal lobes spread outward, away from the midline; in dorsal-oblique view propodeum descends to metanotal groove by a short, steep face; postpetiole from above oval; anterior third of promesonotal dorsum carinulate; all of head and mesosoma foveolate and opaque.
Minor: unknown.
MEASUREMENTS (mm) Lectotype major: HW 0.94, HL 0.96, SL 0.62, EL 0.12, PW 0.42.
COLOR Major: concolorous dark reddish yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major, with hind femur included. Lower: paratype, minor. ECUADOR: Jatun Sacha, 7 km east-southeast of Puerto Misahualli, Napo, 1°04′S 37°37′W (Philip S. Ward). Scale bars = 1 mm.



Pheidole viriosa **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *viriosa,* robust, strong.

DIAGNOSIS Similar in various traits to *angulifera, nitidicollis, erratilis, gilva, polita* (in the *tristis* group), *schmalzi,* and *tambopatae,* differing as follows. **Major**: head bicolored as illustrated; median ocellus present; humerus in dorsal-oblique view bearing a right-angular extension; occipital cleft very broad and moderately deep; propodeal spines directed strongly backward; postpetiole very narrow and oval from above; rear quarter of dorsal head surface smooth and shiny.

Minor: occiput somewhat narrowed, its margin weakly convex, and lacking nuchal collar; propodeal spines directed strongly backward; head almost completely smooth and shiny, with only a few faint carinulae at the antennal fossae; pilosity long, some hairs longer than Eye Length.

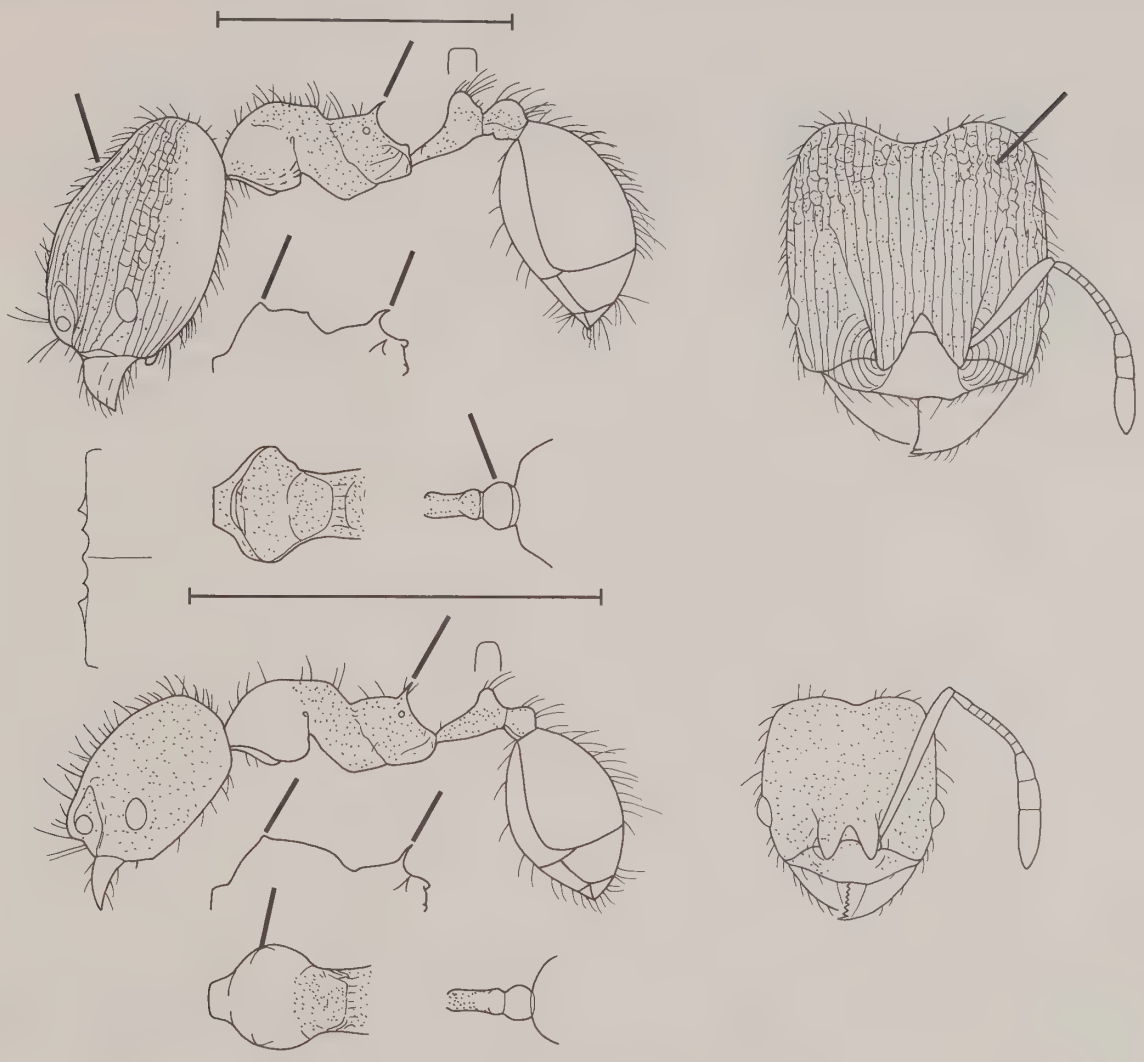
MEASUREMENTS (mm) Holotype major: HW 0.74, HL 0.80, SL 0.42, EL 0.10, PW 0.36.
Paratype minor: HW 0.42, HL 0.46, SL 0.40, EL 0.12, PW 0.30.

COLOR Major: head bicolored, with vertex and frontal triangle medium brown and rest of head brownish yellow; tarsi brownish yellow; rest of body and appendages light brown.
Minor: head and gaster dark brown, tarsi brownish yellow, rest of body and appendages medium brown.

RANGE Known only from the type locality.

BIOLOGY Sifted from litter on the floor of rainforest (P. S. Ward).

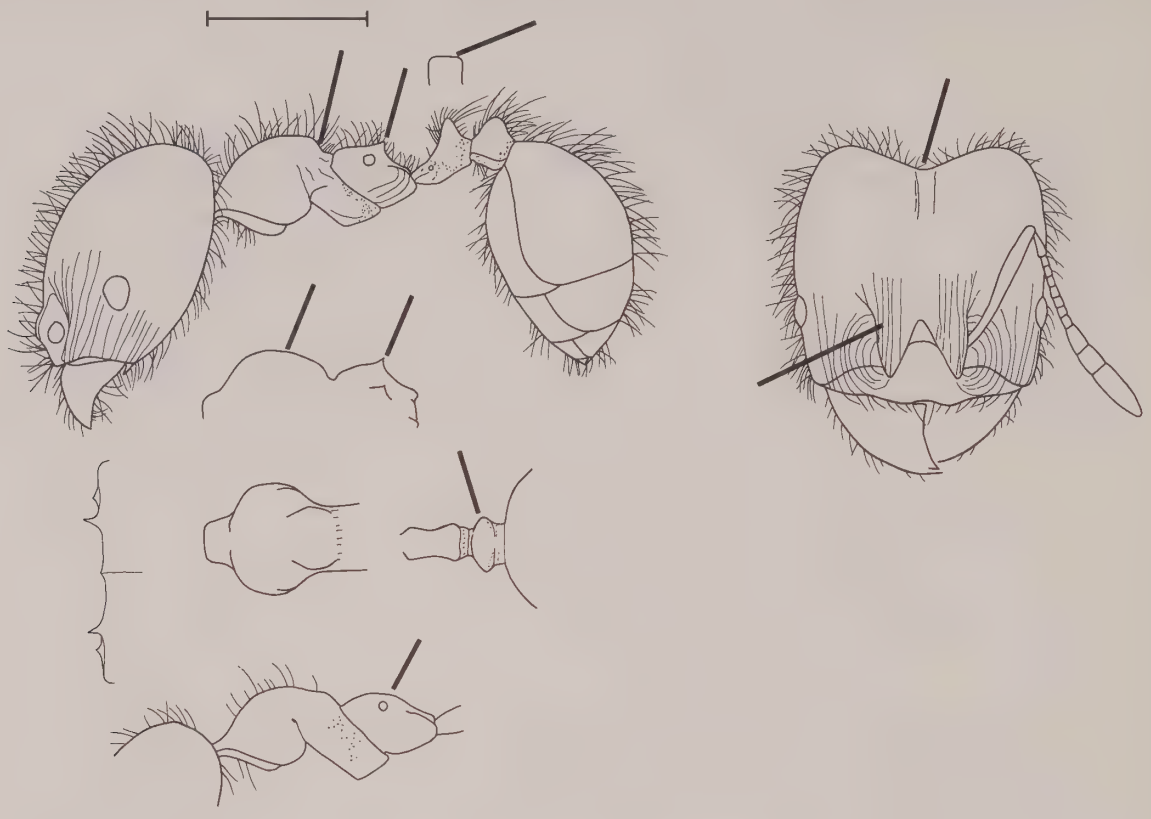
FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: 7 km north of Huatusco, Veracruz, 1280 m (A. Newton). Scale bars = 1 mm.



Pheidole xyston **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *xyston,* shaft of a spear, referring to the long propodeal spine of the minor.
DIAGNOSIS Similar to *ceibana, lemnisca, peltastes, perkinsi, renae,* and *tayrona,* distinguished in the **major** by the rugoreticulate occiput, shallowly concave posterior cephalic profile, cornulate humerus, and posteriorly curving propodeal spine; and in the **minor** by the toothed humerus and relatively long, straight propodeal spine.
MEASUREMENTS (mm) Holotype major: HW 0.70, HL 0.78, SL 0.44, EL 0.10, PW 0.40.
Paratype minor: HW 0.42, HL 0.42, SL 0.40, EL 0.06, PW 0.26.
COLOR Major: mandibles and body medium brown, rest of appendages yellowish brown.
RANGE Known only from the type series and from a second series collected 11 km north of San Andrés Tuxtla, Veracruz, at 1400 m (P. S. Ward).
BIOLOGY Philip Ward took the San Andrés Tuxtla series from a rotten log in cloud forest.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Coxipó, Mato Grosso. Scale bar = 1 mm.

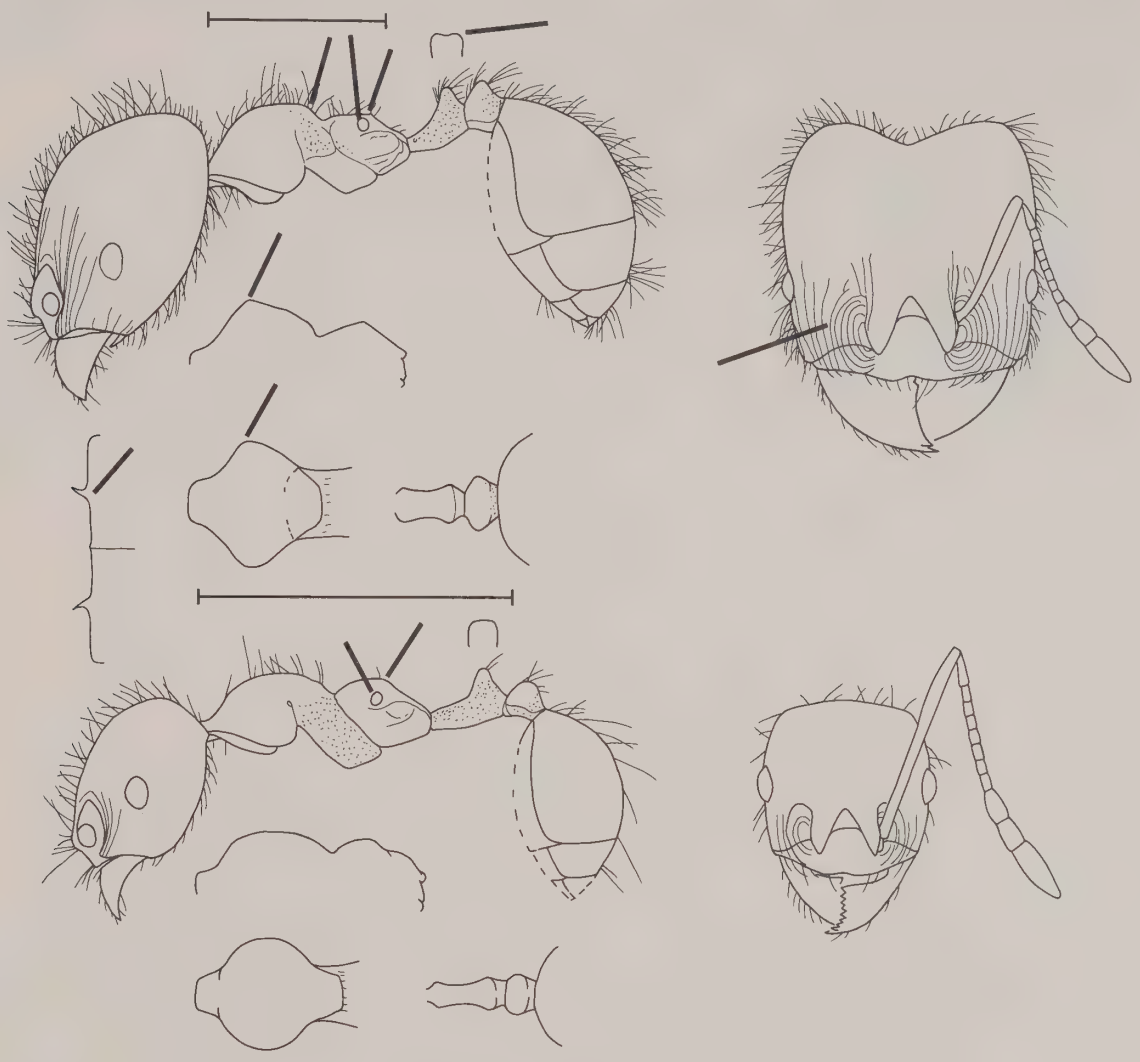


Pheidole capillata Emery, **new status**

Pheidole gertrudae subsp. *capillata* Emery 1906c: 151.

TYPES Mus. Civ. Stor. Nat. Genova.
ETYMOLOGY L *capillata,* hairy.
DIAGNOSIS Close to *gertrudae* (q.v.), and possibly synonymous with it, but differing in the following combination of traits.
Major: propodeal spines present but only as short, thick denticles; frontal lobes covered by longitudinal carinulae; and thinner petiolar node in side view.
MEASUREMENTS (mm) Lectotype major: HW 1.56, HL 1.60, SL 0.84, EL 0.22, PW 0.74.
Paralectotype minor: HW 0.64, HL 0.70, SL 0.78, EL 0.14, PW 0.42.
COLOR Major: body mostly light yellowish brown with a slight reddish tint; gaster medium yellowish brown with reddish tint to plain medium brown.
RANGE Goiás and Mato Grosso, Brazil; and Madre de Dios and San Martin, Amazonian Peru.
BIOLOGY At Cuzco Amazónico, near Puerto Maldonado, Madre de Dios, Peru, Stefan Cover and John Tobin found a population of *capillata* colonies in a grassy clearing on the Madre de Dios River. The nests were in heavy clay, and the workers were observed foraging on cloudy days and at dawn and dusk. The species was absent from the adjacent rainforest.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Guanabara, Rio de Janeiro. Scale bars = 1 mm.



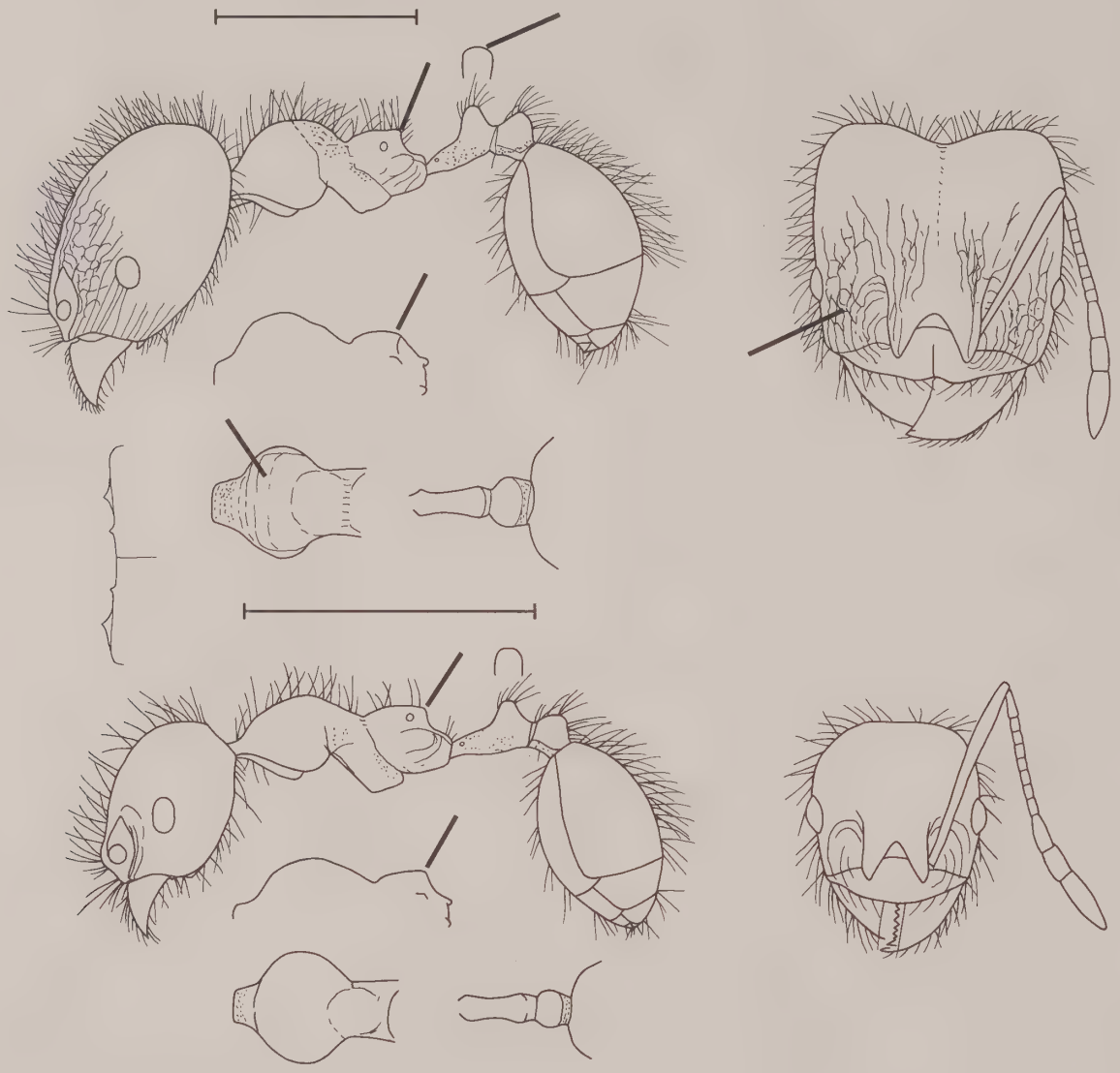
Pheidole gertrudae Forel

Pheidole gertrudae Forel 1886b: xiii. Syn.: *Megalomyrmex humilis* Borgmeier 1930: 35, synonymy by Kempf 1960f: 463. *Pheidole gertrudae* var. *leonhardi* Forel 1901m: 62, n. syn.; *Pheidole gertrudae* var. *loretensis* Santschi 1933f: 108, n. syn.

TYPES Mus. Nat. Hist. Genève.
ETYMOLOGY Named in honor of Gertrude Naegeli.
DIAGNOSIS With the distinctive qualities of the *gertrudae* group: propodeal spines greatly reduced to absent in **major**, absent in **minor**; propodeal spiracle extremely large; entire body mostly smooth and shiny. Differs from other members of group (*capillata, jeannei,* q.v.) in the major in the following combination of traits: no rugoreticulum on head, humerus subangulate in dorsal-oblique view; no trace of a propodeal spine, with the basal and declivitous faces of the propodeum in side view meeting in a very wide oblique angle.
MEASUREMENTS (mm) Lectotype major: HW 1.30, HL 1.34, SL 0.76, EL 0.26, PW 0.62.
Paralectotype type minor: HW 0.64, HL 0.66, SL 0.72, EL 0.14, PW 0.40.
COLOR Major: concolorous light reddish yellow.
Minor: concolorous light brownish yellow.
RANGE Widespread in Brazil, from Amazonas to Santa Catarina; also recorded from Tipuani, La Paz, Amazonian Bolivia (var. *leonhardi* types); Canindeyú Department, Paraguay; and Loreto, Misiones, northern Argentina (var. *loretensis* types).
BIOLOGY Unknown.

Compare with *capillata, gertrudae*

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: Taperinha, Santarém, Pará, 2°54′S 54°20′N (Robert L. Jeanne). Scale bars = 1 mm.



Pheidole jeannei **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the collector and distinguished hymenopterist, Robert L. Jeanne.

DIAGNOSIS A member of the *gertrudae* group, easily distinguished in the **major** from the other two known members *(capillata, gertrudae)* by the extensive rugoreticulum on the head, transverse carinulae on the pronotal dorsum, and lack of any propodeal spine or denticle, with the basal and declivitous propodeal faces in side view forming a blunt right angle.

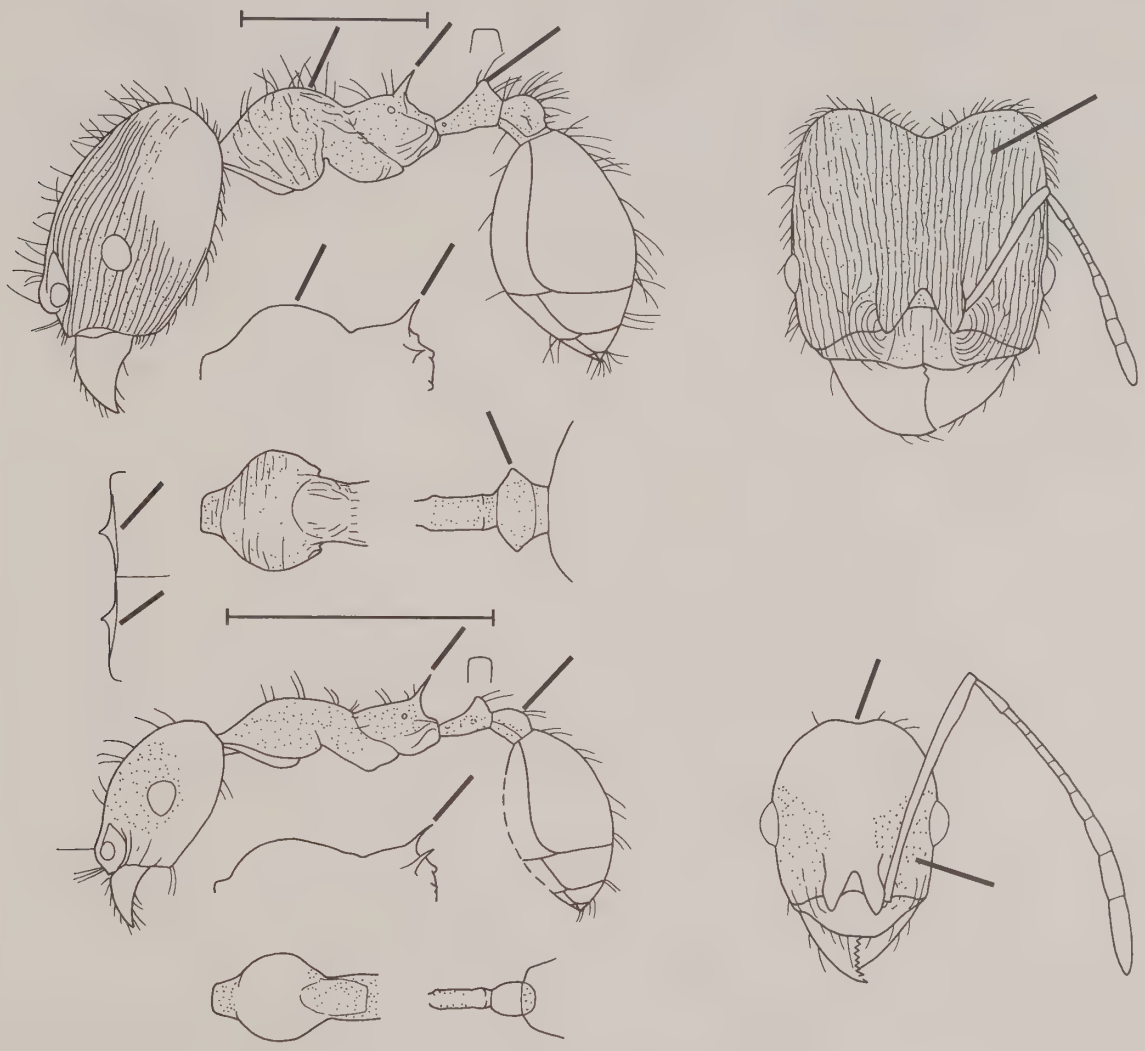
MEASUREMENTS (mm) Holotype major: HW 1.12, HL 1.10, SL 0.68, EL 0.16, PW 0.60.
Paratype minor: HW 0.56, HL 0.60, SL 0.64, EL 0.14, PW 0.40.

COLOR Major: concolorous medium brown, appendages a slightly contrasting brownish yellow.
Minor: concolorous dark reddish brown.

RANGE Known only from the type locality.

BIOLOGY The type series was collected from the floor of lowland rainforest.

FIGURE Upper: major. Lower: minor. CALIFORNIA: Split Mountain, Anza State Park, near Palm Springs, 150 m (W. S. Creighton). (Type locality: Carizozo, vicinity of the lava beds of the Tularosa Basin, New Mexico; C. P. Stroud). Scale bars = 1 mm.



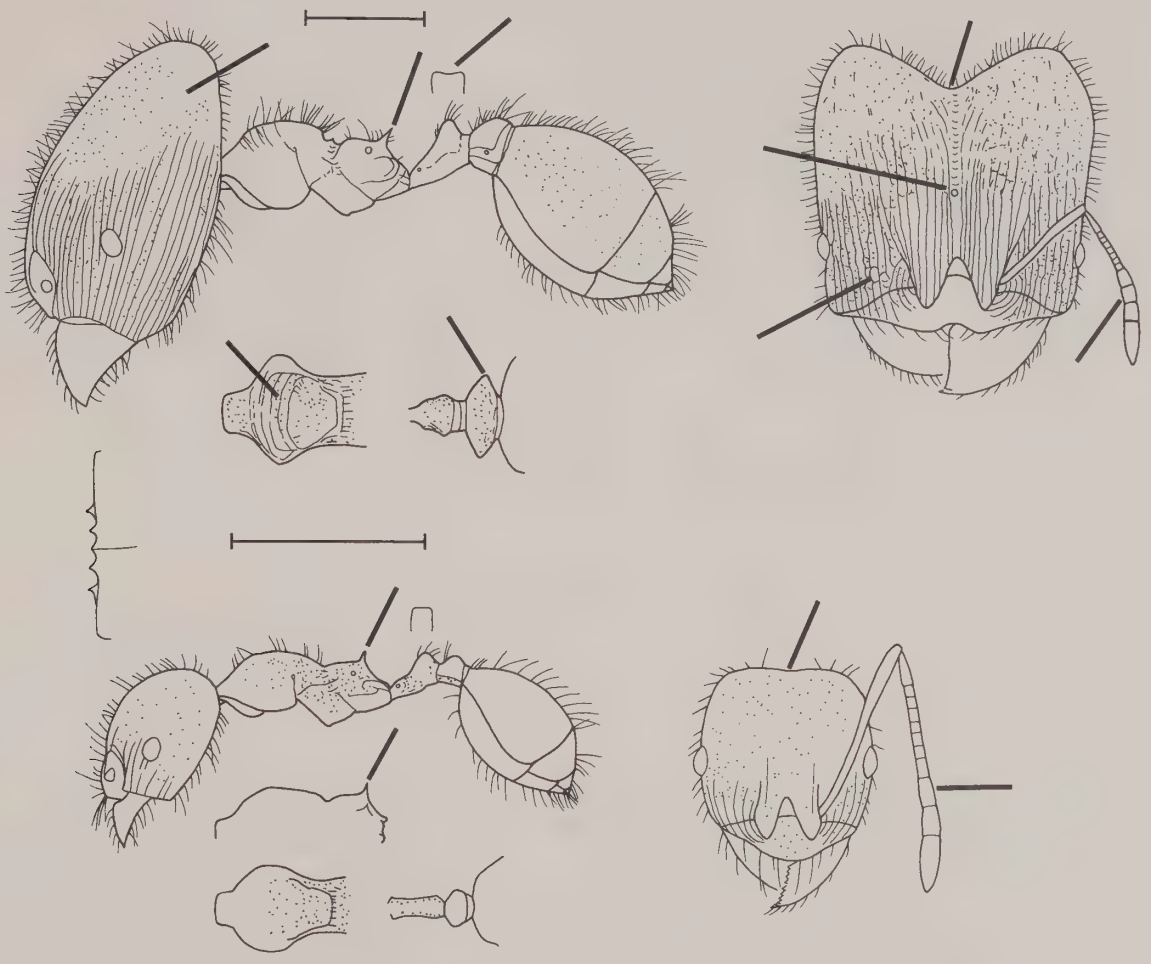
Pheidole clydei Gregg

Pheidole (Ceratopheidole) clydei Gregg 1950: 89.

TYPES Mus. Comp. Zool. Harvard; holotype minor may be at the Field Museum, Chicago.
ETYMOLOGY Eponymous.
DIAGNOSIS A member of the *granulata* group (4-segmented club), close to *grundmanni* and distinguished as follows.
Major (no comparison available with *grundmanni*): hypostoma with only 2 teeth; all of dorsal surface of head longitudinally carinulate; dorsal promesonotal profile in side view smoothly semicircular; petiolar node in side view tapering to a blunt point; postpetiolar node from above conulate.
Minor: propodeal spine needle-like, as long as half the length of the basal propodeal face anterior to it; petiolar node depressed, and petiole as a whole cylindrical; occiput narrow in full-face view, and shallowly concave; the cephalic foveolation is variable, and can occasionally cover the entire upper surface of the head, in which case the carinulae of the head may extend posteriorly between the eye and the antennal insertions; sides of pronotum foveolate and opaque. In habitus and number of hypostomal teeth, this species is evidently a derivative of the *pilifera* group.
MEASUREMENTS (mm) Major: HW 1.20, HL 1.32, SL 0.72, EL 0.20, PW 0.62.
Syntype minor: HW 0.50, HL 0.66, SL 0.78, EL 0.14, PW 0.34.
COLOR Major: head and mesosoma concolorous reddish yellow; waist, gaster, and appendages contrasting light reddish brown.
Minor: body and legs concolorous light brown, mandibles and antennae brownish yellow.
RANGE Recorded from New Mexico, Arizona, Nevada, and southern California.

BIOLOGY This species utilizes an unusual nest site: rock crevices. Gregg (1953b) found a colony nesting in crevices between a boulder and thin laminae split from its surface, with no contact with the soil. Creighton (1965a) found nests on top of large boulders 4.5 meters high and 6–9 meters across, while G. E. Wheeler and J. N. Wheeler (1973e) encountered them in very narrow horizontal cracks in the almost solid rock walls of California's Deep Canyon. At the last locality, according to Wheeler and Wheeler, "The minors did the foraging, bringing home arthropods or fragments thereof, never seeds. The majors did not leave the nests except to assist minors by carving large pieces of foraged food into smaller bits. But their chief duty appeared to be guard duty: a group of them stood just inside the entrance, where they savagely attacked any object thrust into the nest entrance. The minors, by contrast, were not aggressive, which suggests they are scavengers, not predators." Recent discoveries made by Stefan Cover in Arizona indicate that *clydei* is a member of a small guild of rock-crevice-inhabiting *Pheidole* that includes *P. portalensis* n. sp. Several other members of this guild recently found remain undescribed at present. Like these species, *P. clydei* is only occasionally found in soil or under rocks some distance from rock-crevice habitats.

FIGURE Upper: paratype, major. Lower: paratype, minor. MEXICO: Isla María Cleofas, Las Tres Marías, Nayarit (Roy R. Snelling). Scale bars = 1 mm.

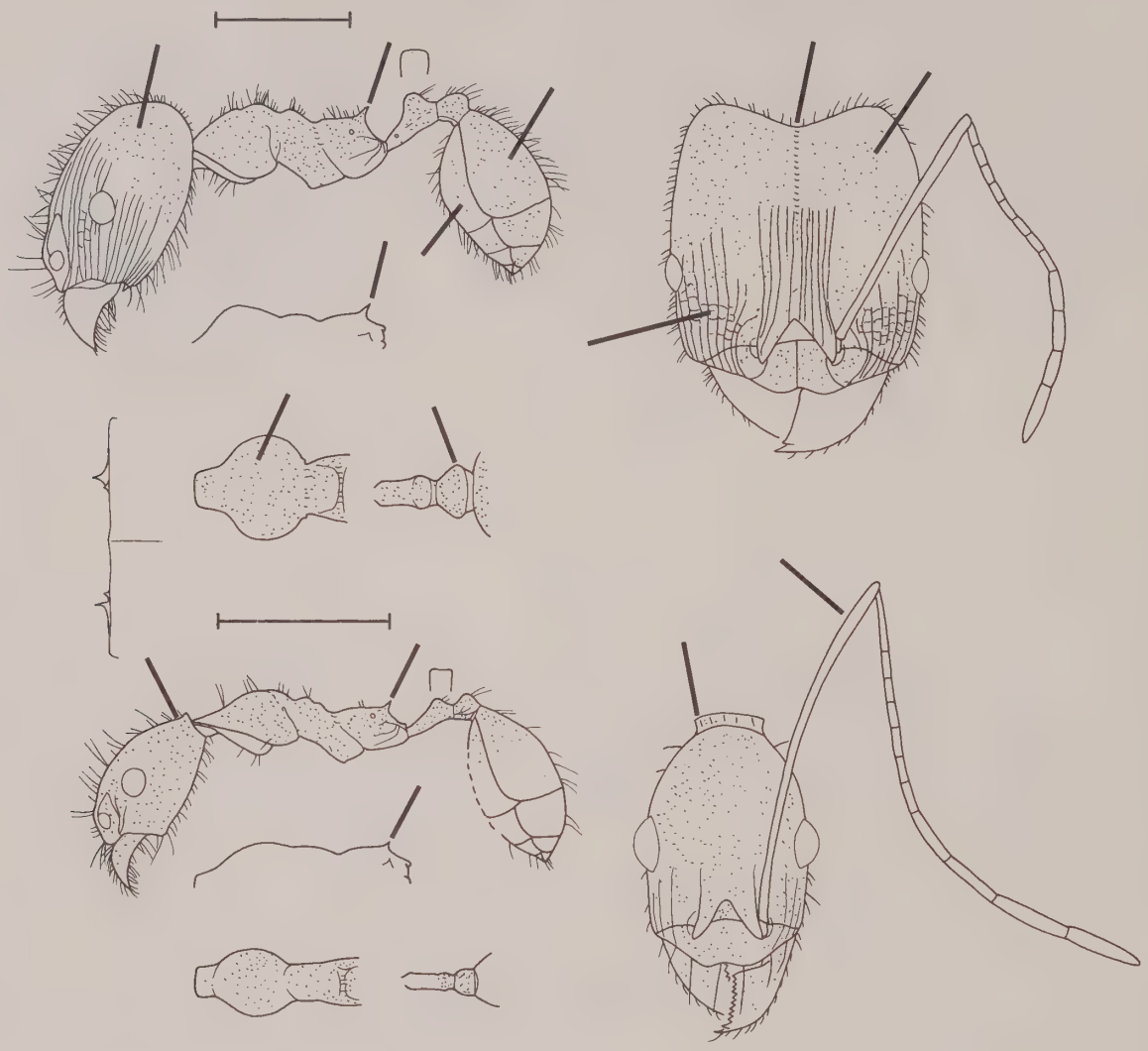


Pheidole dwyeri Gregg

Pheidole dwyeri Gregg 1969b: 97.

TYPES Natural History Museum of Los Angeles County; Mus. Comp. Zool. Harvard; Amer. Mus. Nat. Hist.
ETYMOLOGY Named after Richard F. Dwyer, who sponsored the Snelling collecting tour of Las Tres Marías.
DIAGNOSIS A very distinctive species in the small group of *Pheidole* that possess 4-segmented antennal clubs.
Major: very large; head disproportionately large, with Head Width more than 2.5× Pronotal Width; head tapered strongly toward occiput in side view; in full-face view, occiput deeply and subangularly concave; median ocellus present; small patch of rugoreticulum present laterad to each antennal fossa.
Minor: propodeal spine of medium length; occiput in full-face view broad and weakly concave.
MEASUREMENTS (mm) Paratype major: HW 2.56, HL 2.58, SL 1.24, EL 0.24, PW 1.00.
Paratype minor: HW 0.66, HL 0.74, SL 0.76, EL 0.12, PW 0.42.
COLOR Major and minor: concolorous medium reddish brown.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: major. Lower: minor. BAJA CALIFORNIA SUR, MEXICO: Burrera (Roy R. Snelling). (Type locality: Tepic, Nayarit, collected by Eisen and Vaslit). Scale bars = 1 mm.

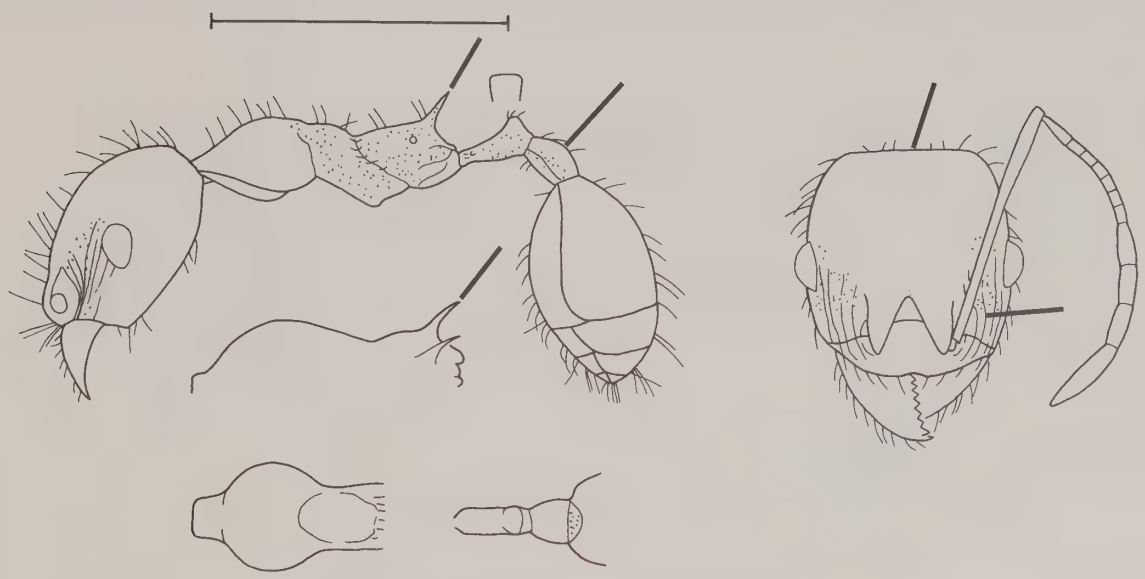


Pheidole granulata Pergande

Pheidole granulata Pergande 1896: 890.

TYPES Nat. Mus. Nat. Hist. U. S.
ETYMOLOGY L *granulata,* of small grains, roughened on the surface, probably alluding to the foveolate body surface.
DIAGNOSIS A member of the small *granulata* group, characterized by a 4-segmented antennal club, and distinguished within it as follows.
Major: entire body including all the gastral segments, foveolate and opaque; antennal scape very long, exceeding occipital corner; head subrectangular, with a deeply concave occipital border in full-face view; rugoreticulum present between each eye and antennal fossa; postpetiole from above bell-shaped.
Minor: occiput tapered into a neck with a nuchal collar; scape very long, its tip exceeding the occipital corner in full-face view by half its own length.
Overall, the habitus of this species is typical for a member of the *fallax* group, except for the 4-segmented club.
MEASUREMENTS (mm) Major (Burrera, Baja California Sur): HW 1.48, HL 1.74, SL 1.58, EL 0.26, PW 0.72.
Minor (Burrera): HW 0.60, HL 0.92, SL 1.32, EL 0.20, PW 0.44.
COLOR Major: brownish yellow, with gaster a shade darker.
Minor: concolorous medium yellow.
RANGE Known from Baja California Sur and San Diego, California.
BIOLOGY Unknown.

FIGURE Paratype, minor. UTAH: Ashley Canyon, near Vernal, Uintah Co., 1800 m (A. W. Grundmann). Scale bar = 1 mm.



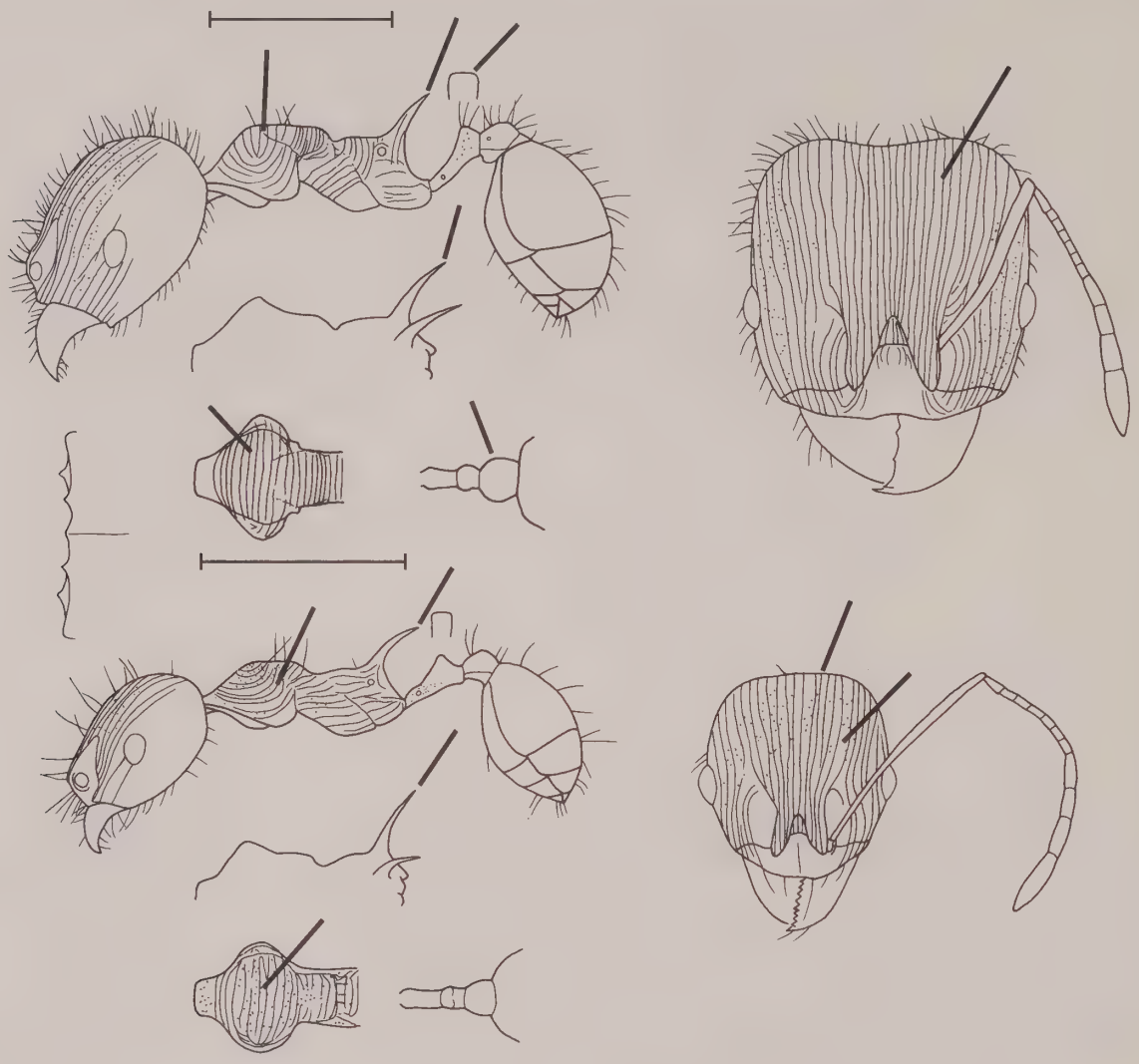
Pheidole grundmanni M. R. Smith

Pheidole (Ceratopheidole) grundmanni M. R. Smith 1953e: 144.

TYPES Nat. Mus. Nat. Hist. U. S.; Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the collector, A. W. Grundmann.
DIAGNOSIS A member of the *granulata* group (4-segmented antennal club), close to *clydei* and distinguished as follows.
Minor: propodeal spine more than half as long as the basal face of the propodeum anterior to it; petiolar node depressed, and petiole as a whole cylindrical; promesonotal profile in dorsal-oblique view forming a single smooth curve; occipital margin in full-face view broad and flat; carinulae of head reaching eye level; sides of pronotum smooth and shiny.
MEASUREMENTS (mm) Paratype minor: HW 0.64, HL 0.70, SL 0.80, EL 0.16, PW 0.40.
COLOR Minor: body concolorous yellowish brown; appendages medium yellow; body hairs a contrasting white.
RANGE Known only from the type locality.
BIOLOGY The types were collected from beneath a stone at the foot of a narrowleaf cottonwood tree, near the mouth of Ashley Canyon several hundred meters below Merkeley Park.

Compare with *clydei, dwyeri, granulata, grundmanni*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. JAMAICA: Troy. Scale bars = 1 mm.

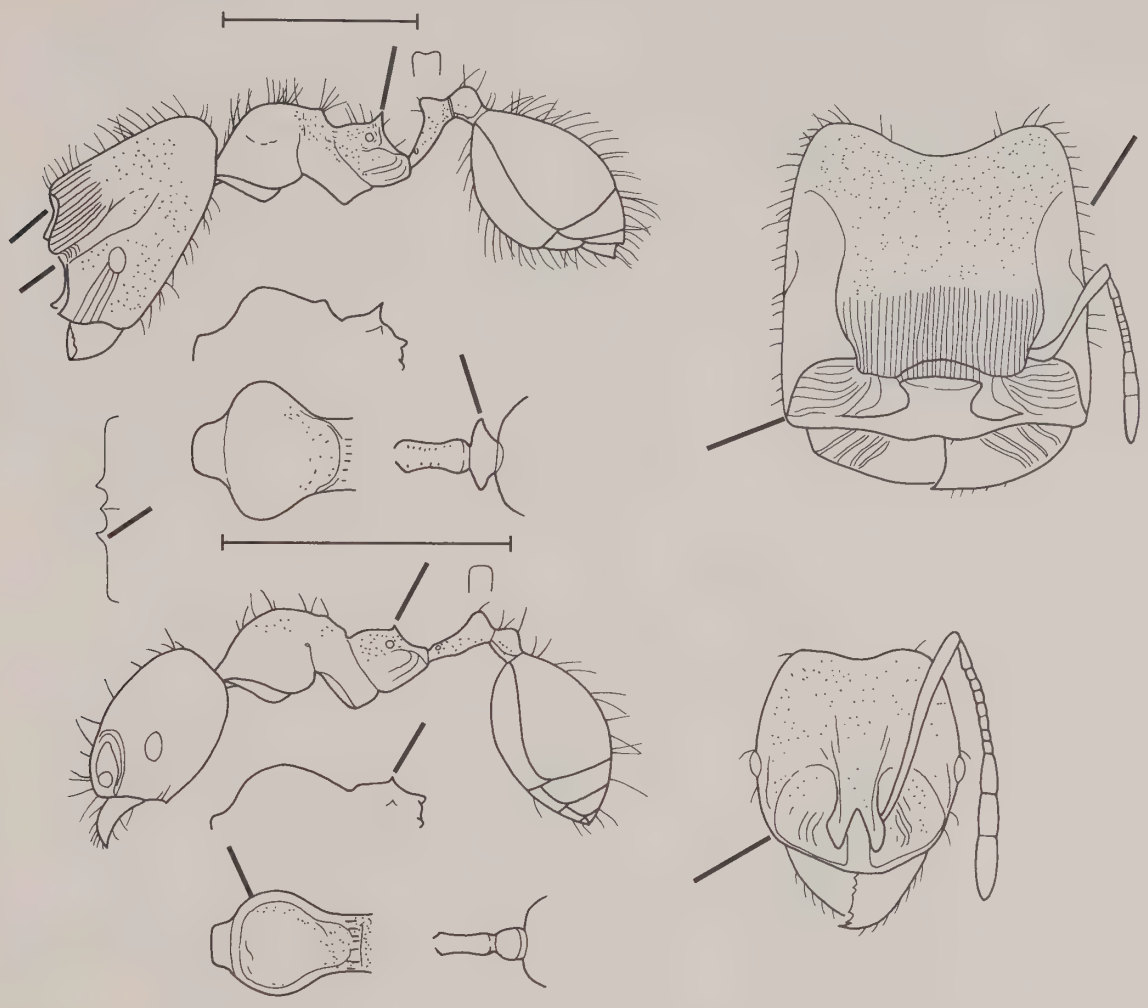


Pheidole hecate Wheeler

Pheidole hecate Wheeler 1911a: 26. Syn.: *Pheidole hecate* subsp. *malevola* Wheeler 1911a: 27, n. syn.; *Pheidole hecate* subsp. *bruesi* Wheeler 1917g: 460, name unavailable, unresolved primary homonym of *Pheidole triconstricta* var. *bruesi* Wheeler 1911b: 169.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *Hecate,* goddess of magic and witchcraft.
DIAGNOSIS A member of the *granulata* group (4-segmented antennae), unique in both castes in the very long propodeal spines and completely carinulate mesosoma.
MEASUREMENTS (mm) Lectotype major: HW 1.20, HL 1.18, SL 0.86, EL 0.20, PW 0.62.
Paralectotype minor: HW 0.72, HL 0.78, SL 0.92, EL 0.16, PW 0.48.
COLOR Major: body very dark reddish brown, appendages light to medium brown.
Minor: body blackish brown, appendages medium brown.
RANGE An apparent Jamaican endemic, *hecate* has been recorded from the following localities on the island: Hardwar Gap, Kingston, Newton, Troy, and southwest side of the main range, Blue Mountains, variously at 600–900 m.
BIOLOGY Unknown.

FIGURE Upper: major. Lower: minor. COLOMBIA: Rio Porce, near Medellín, 1020 m (Neal A. Weber). (Type locality: Rondônia-Mamoré railway track, Km 306, Rondônia, Brazil.) Scale bars = 1 mm.



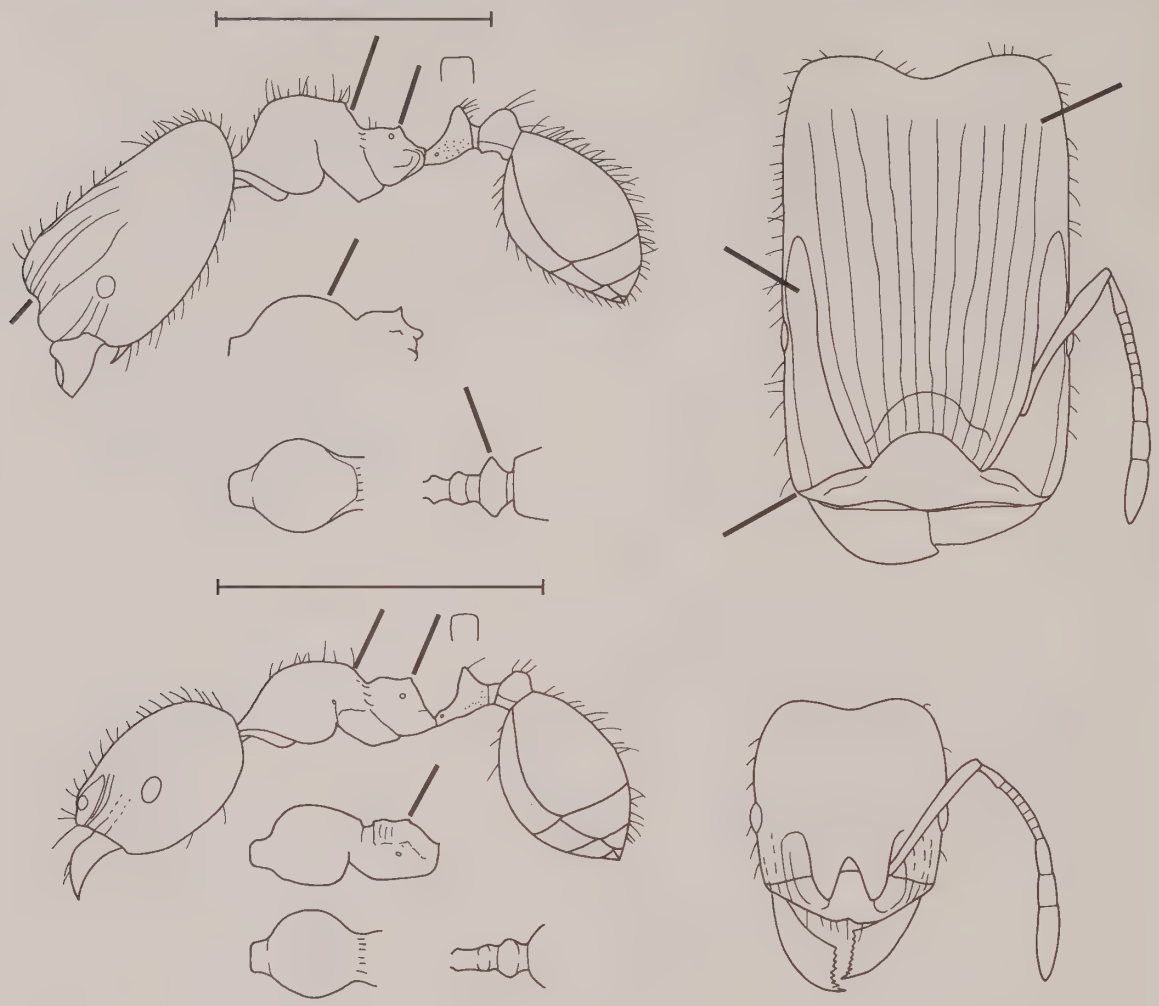
Pheidole colobopsis Mann

Pheidole colobopsis Mann 1916: 439.

TYPES Nat. Mus. Nat. Hist. U.S.
ETYMOLOGY Gr *colobopsis,* docked, clipped, shortened, with reference to the truncated head of the major.
DIAGNOSIS A typical member of the *lamia* group: the **major** has a phragmotic head, with the anterior portion incorporating the clypeus and mandibles flattened (truncated), and deep antennal scrobes. This species is easily distinguished from the other members of the *lamia* group *(lamia, pelor, truncula)* by the shorter head of the **major** and the pattern of carinulae on its head: limited to dense longitudinal rows on the frontal lobes and frontal triangle and transverse rows on the lateral wings of the clypeus. Other differences in body form and sculpturing are as illustrated. The queen is also phragmotic.
MEASUREMENTS (mm) Major (Rio Porce, Colombia): HW 1.08, HL 1.20, SL 0.54, EL 0.14, PW 0.60.
Minor (Rio Porce, Colombia): HW 0.52, HL 0.54, SL 0.52, EL 0.06, PW 0.32.
COLOR Major: mostly light reddish brown; appendages, the truncated front of the head, and a narrow horizontal strip posterior to the eyes dark yellow.
Minor: body and scapes medium reddish brown, other appendages yellowish brown.
RANGE Known only from series collected in Rondônia, Brazil, Rio Porce, Colombia, and Cuzco Amazonico, Madre de Dios, Peru.
BIOLOGY The Peruvian colony was collected in clay soil at the base of a tree in terra firme rainforest. The nest was 12 cm deep and contained a single queen, five majors, and about 200 minors. The majors and minors in this series are a nearly uniform dark yellow to amber color.

Compare with *colobopsis, pelor, truncula*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. TEXAS: Austin (W. M. Wheeler). Scale bars = 1 mm.

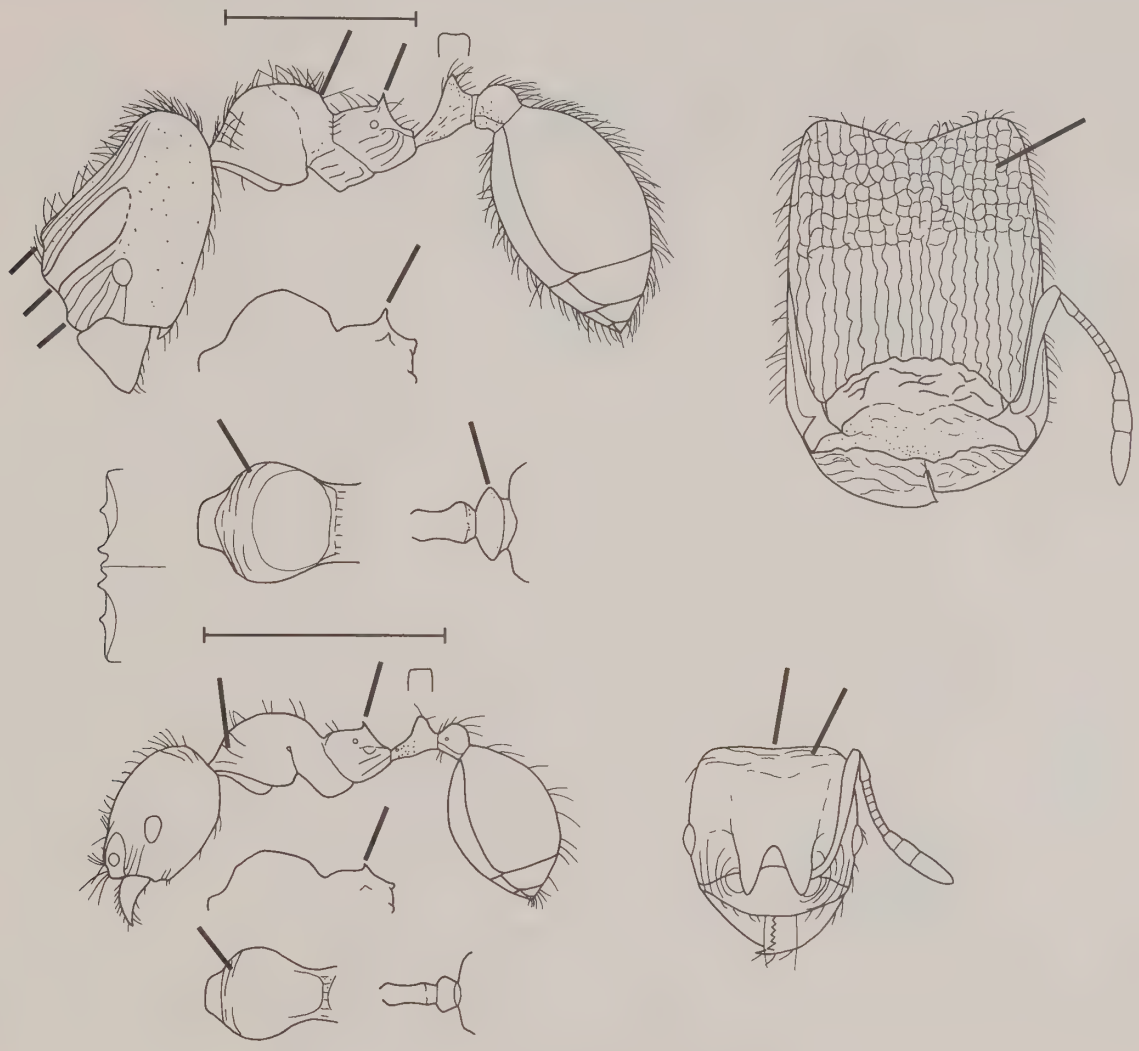


Pheidole lamia Wheeler

Pheidole lamia Wheeler 1901c: 534.

TYPES Mus. Comp. Zool. Harvard; Amer. Mus. Nat. Hist.
ETYMOLOGY Gr *lamia,* a witch or monster that sucks blood, obviously an overstatement in reference to the bizarre head of the major.
DIAGNOSIS A typical member of the *lamia* group: the **major** has a phragmotic head, with the anterior portion incorporating the clypeus and mandibles flattened (truncated), and deep antennal scrobes. This species is easily distinguished from the other members of the *lamia* group *(colobopsis, pelor, truncula)* by the very elongate head of the **major** and sculpturing of its head, which consists exclusively of parallel longitudinal carinulae that extend almost all the way to the occiput; and by the reduction of the propodeal spine in the major and minor to denticles.
MEASUREMENTS (mm) Lectotype major: HW 0.62, HL 0.92, SL 0.37, EL 0.00, PW 0.00.
Paralectotype minor: HW 0.44, HL 0.52, SL 0.48, EL 0.06, PW 0.30.
COLOR Major: concolorous yellow, with a faint reddish tinge.
Minor: concolorous yellow.
RANGE Northern Florida west to at least Austin, Texas.
BIOLOGY *P. lamia* is a reclusive, soil-nesting species. Feener (1981) found that the species, which is seemingly rare because of its infrequent encounters with entomologists, is actually quite abundant at the type locality (Austin, Texas), at least in the secondary oak-hackenberry woodland of the Brackenridge Field Laboratory. In both Florida and Texas mature colonies each contain 500–1500 minor workers, and a much smaller number of major workers. Nests are constructed directly in soil beneath leaf litter, and thus are unusually difficult to find. Buren et al. (1977), studying Florida colonies in laboratory nests, found that the phragmotic majors use their bulldozer-like heads effectively in defense against marauding thief ants of the genus *Solenopsis*. At Austin, minor workers were observed foraging around the clock in warm weather (Feener 1981).

FIGURE Upper: holotype major. Lower: paratype, minor. TEXAS: Brackenridge Laboratory, a field station of the University of Texas in Austin (D. H. Feener). Scale bars = 1 mm.

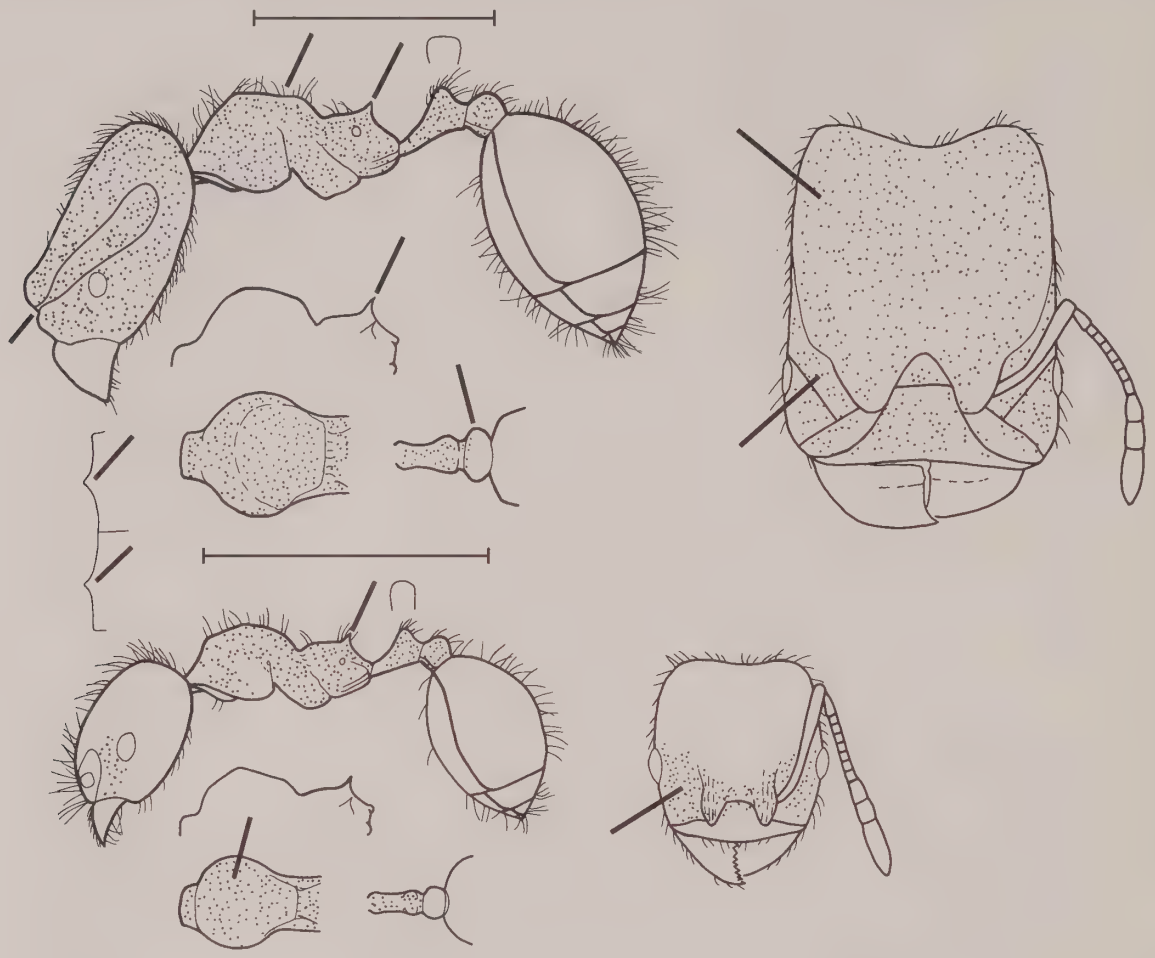


Pheidole pelor **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *pelor,* prodigy, monster, referring to the bizarre head form.
DIAGNOSIS A typical member of the *lamia* group: the **major** has a phragmotic head, with the anterior portion incorporating the clypeus and mandibles flattened (truncated), and deep antennal scrobes. This species is easily distinguished from the other members of the *lamia* group *(colobopsis, lamia, truncula)* by the rugoreticulate posterior dorsum of the head, preceded by parallel longitudinal carinulae that extend to all the surface of the frontal lobes, and by the irregularly rugose sculpturing of the central part of the clypeus.
MEASUREMENTS (mm) Holotype major: HW 1.00, HL 1.30, SL 0.50, EL 0.14, PW 0.56.
Paratype minor: HW 0.60, HL 0.64, SL 0.46, EL 0.10, PW 0.40.
COLOR Major: concolorous dark yellow.
Minor: concolorous medium yellow.
RANGE Known only from the type locality, and two other localities in central Texas (Pedernales State Park, Blanco Co. and Junction, Kimble Co.). At the Brackenridge Field Laboratory in Austin, it occurs with the similar species *P. lamia*.
BIOLOGY Unknown.

Compare with *colobopsis, lamia, pelor*

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Peñas Blancas, Alajuela, 10°30′N 84°70′W 940 m (J. T. Longino). Scale bars = 1 mm.



Pheidole truncula **new species**

TYPES INBio.

ETYMOLOGY L *truncula,* diminutive of *trunca,* cut off, maimed, referring to the head of the major.

DIAGNOSIS A typical member of the *lamia* group: the **major** has a phragmotic head, with the anterior portion incorporating the clypeus and mandibles flattened (truncated), and deep antennal scrobes. This species is easily distinguished from the other members of the *lamia* group *(colobopsis, lamia, pelor)* by the complete absence of carinulae on the head, which is instead foveolate and opaque, and by other differences in body form and sculpturing as depicted.

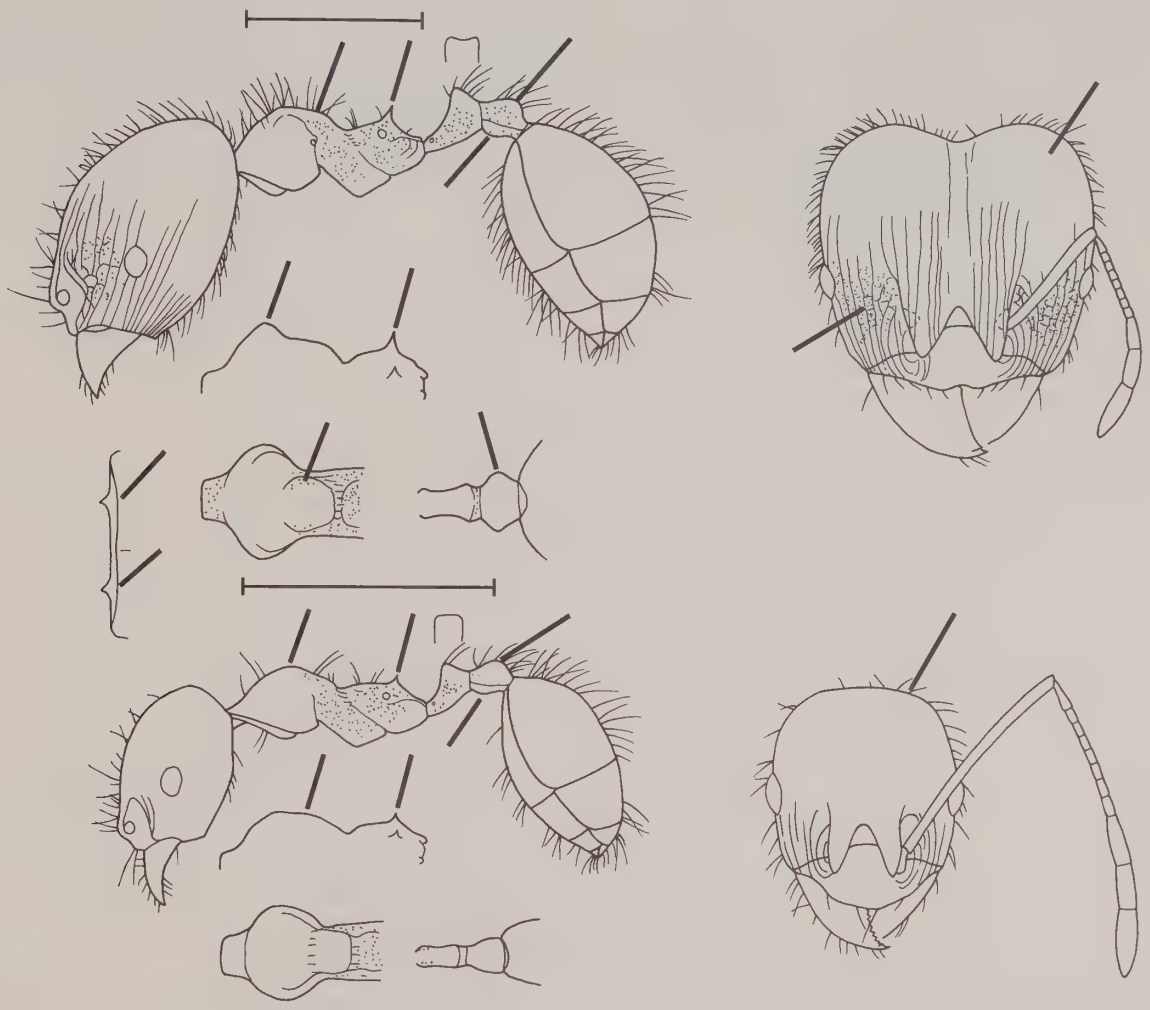
MEASUREMENTS (mm) Holotype major: HW 0.74, HL 0.94, SL 0.42, EL 0.14, PW 0.44.
Paralectotype minor: HW 0.50, HL 0.52, SL 0.40, EL 0.10, PW 0.30.

COLOR Major: concolorous yellowish brown.
Minor: light brown except for funiculus and tarsi, which are dark yellow.

RANGE Known only from several collections from the type locality.

BIOLOGY Occurs at Peñas Blancas in wet forest and nests at least in part arboreally, apparently in live plant stems (Longino 1997). On one occasion workers were mixed with those of the rare army-ant-like ponerine *Simopelta,* making it likely that the *truncula* were under attack as prey at the moment of collection.

FIGURE Upper: major. Lower: minor. BAHAMAS: Grand Bahama Island. (Type locality not cited.) Types not seen. Scale bars = 1 mm.



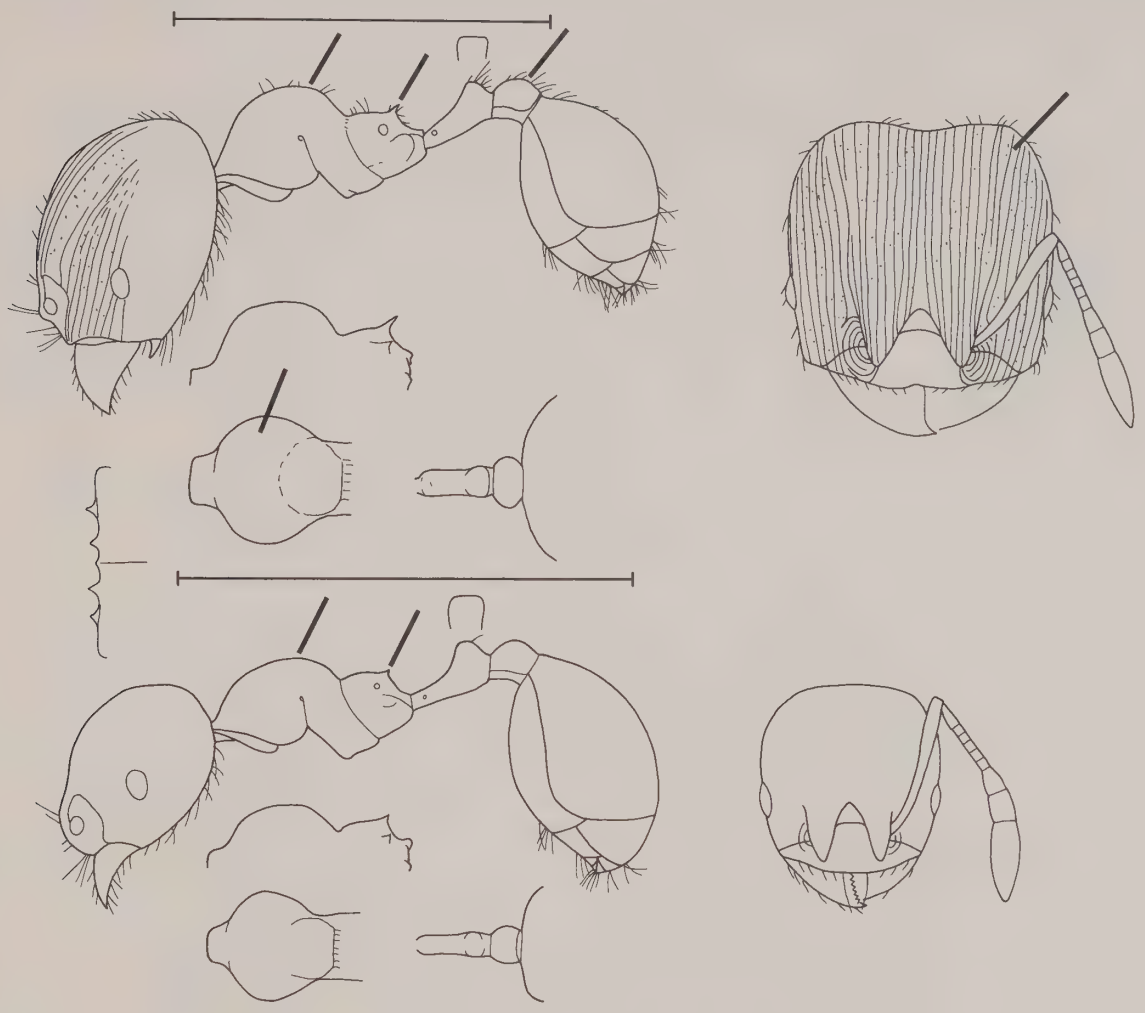
Pheidole megacephala (Fabricius)

Formica megacephala Fabricius 1793: 161. Combination in *Pheidole* by Roger 1863b: 30. Extensive synonymy and citation of infraspecific forms cited by Bolton 1995b.

TYPES Unknown.
ETYMOLOGY Gr L *megacephala,* large-headed, referring to the major.
DIAGNOSIS **Major** and **minor**: in side view, entire postpetiole oval in shape, with all of the ventral margin bulging in a conspicuous convexity, and the node oval, low, and weakly developed; mesonotal convexity absent, the promesonotal profile forming a nearly smooth semicircle; color brownish yellow.
Major: outline of head plus mandibles in full-face view forms a near-perfect heart shape; rugoreticulum present between eye and antennal fossa.
Minor: occiput broad, lacking an occipital collar.
MEASUREMENTS (mm) Major (Grand Bahama Island): HW 1.32, HL 1.32, SL 0.64, EL 0.18, PW 0.60.
Minor (Grand Bahama Island): HW 0.54, HL 0.62, SL 0.66, EL 0.12, PW 0.34.
COLOR Major and minor: brownish yellow.
RANGE Widespread although spottily distributed, and sometimes locally very abundant, from southern Florida, Bermuda, and the Bahamas south through the West Indies, southern Mexico, and Central America, to as far south in South America as Santa Catarina, Brazil.

BIOLOGY The colonies, which are continuous, with no evident pheromone-based boundaries, and large numbers of fertile queens, are able to reach enormous size. In some areas, especially islands such as Madeira, Culebrita, and the Dry Tortugas, they form a virtually continuous supercolony that excludes most other ant species. They do best in relatively moist, disturbed habitats, thus thrive around human habitations and in cultivated land. Nest sites are highly variable, from within and beneath rotting logs and underneath rocks and sidewalk flagstones to the bark and trunk-based detritus of standing trees. Columns of foragers travel substantial distances from one nest site to another and to food sources. *P. megacephala* are aggressive toward other species, and war with populations of such locally dominant species as the Indo-Australian weaver ant *Oecophylla smaragdina* and the cosmopolitan Argentine ant *Linepithema humile (= Iridomyrmex humilis)*. General accounts of this important species are given by Wilson (1971), Hölldobler and Wilson (1990), and D. F. Williams et al. (1994). A bibliography of the ant for North America is provided by D. R. Smith (1979). The devastating effect on the native Hawaiian insect fauna was described by the pioneering entomologist R. C. L. Perkins (1913).

FIGURE Upper: lectotype, major. Lower: paratype, minor. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios (Stefan Cover and John E. Tobin). Scale bars = 1 mm.



Pheidole gemmula **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *gemmula,* small jewel.

DIAGNOSIS A member of the *perpusilla* group (very small, with 10-segmented antennae), distinguished as follows.

Major: all of dorsum of head except frontal triangle and mid-clypeus covered by longitudinal carinulae; in side view, promesonotal profile forms an unbroken, near-perfect semicircle; propodeal spine small; postpetiolar node in side view depressed; mesosoma, waist, and gaster entirely devoid of sculpture.

Minor: in side view, promesonotal profile forms an unbroken, near-perfect semicircle; propodeal spines reduced to denticles; other than carinulae around the antennal fossae, the entire body lacks sculpturing, and is entirely smooth and shiny.

MEASUREMENTS (mm) Holotype major: HW 0.72, HL 0.72, SL 0.36, EL 0.10, PW 0.34.

Paratype minor: HW 0.42, HL 0.44, SL 0.32, EL 0.06, PW 0.24.

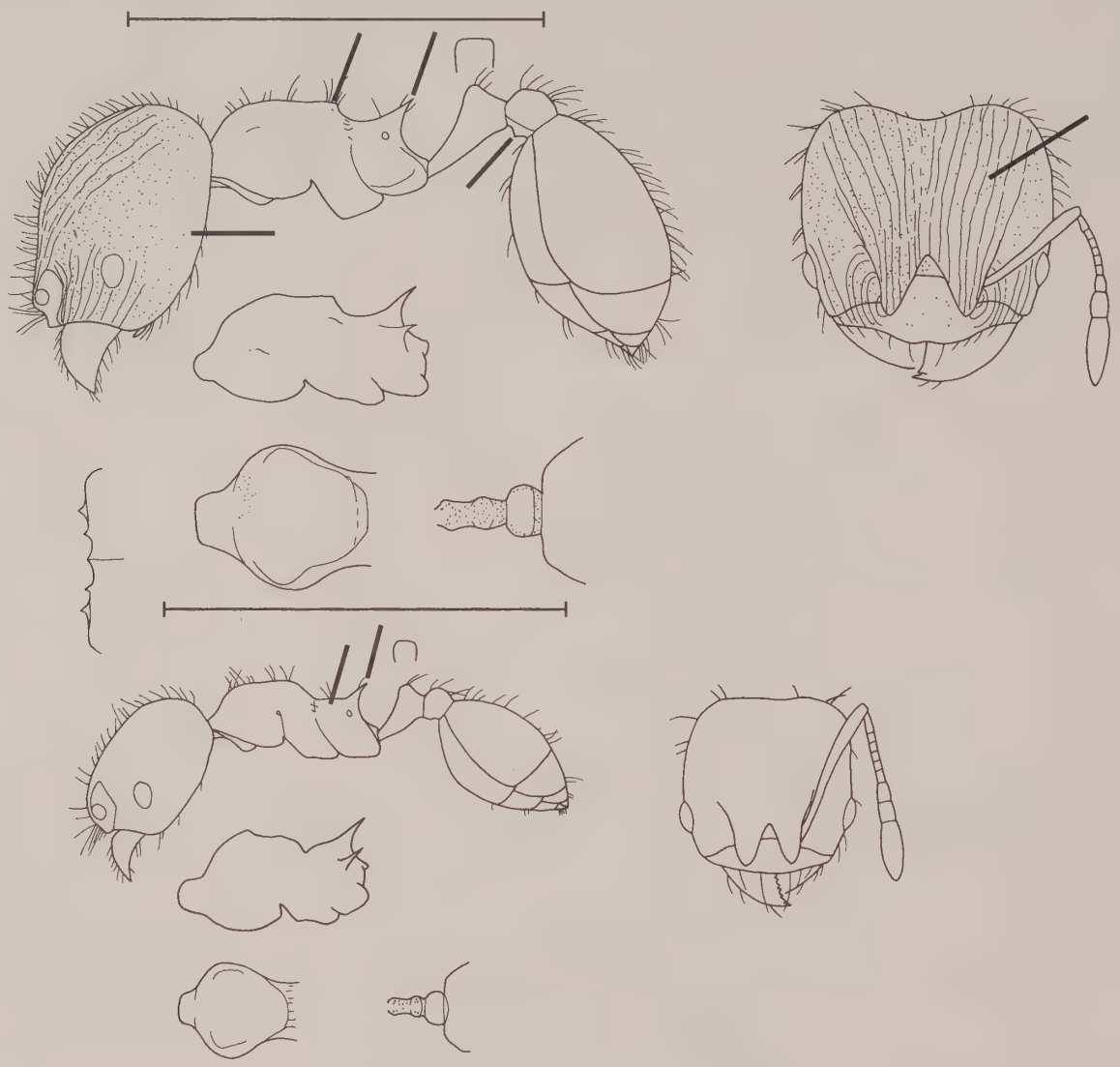
COLOR Major: body medium yellow, except for rear four-fifths of head, which is yellowish brown, and a yellowish brown spot in the center of the first gastral tergite.

Minor: concolorous clear yellow.

RANGE Known only from the type locality.

BIOLOGY The type series is a colony fragment found in a moist white fragment of rotting wood buried in leaf litter, on the floor of mature terra firme rainforest.

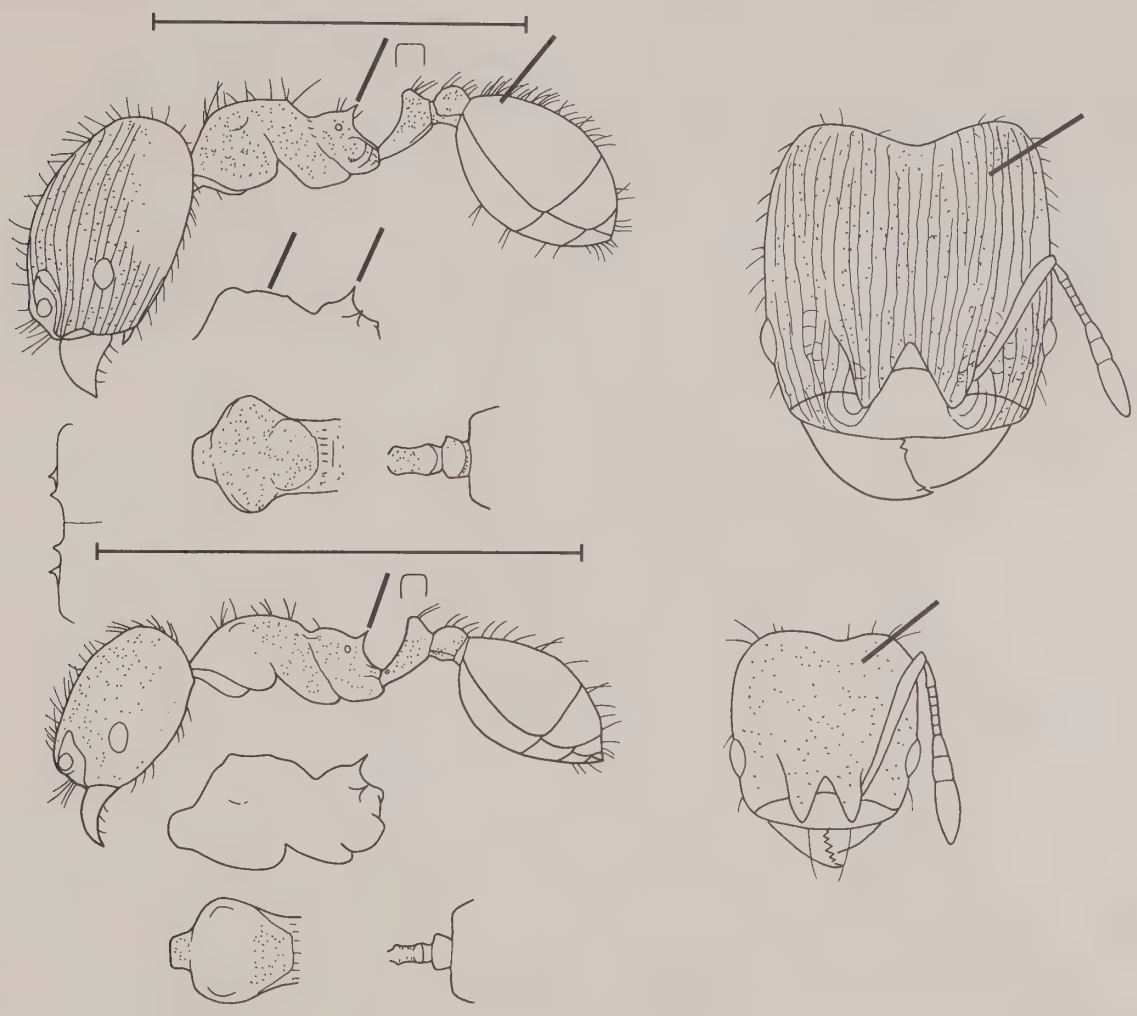
FIGURE Upper: holotype, major. Lower: paratype, minor. ECUADOR: 25 km north of Puyo, Pastaza, 1000 m (Stewart B. and Jarmila Kukalová-Peck). Scale bars = 1 mm.



Pheidole globularia **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *globularia,* of a small ball, referring to the head shape of the major.
DIAGNOSIS A member of the *perpusilla* group (very small, with 10-segmented antennae), distinguished within the group as follows.
Major: head in full-face view 1.1× times broader than long; carinulae originating on the frontal lobes spread laterad away from the midline as they approach the occiput; sides of head posterior to eye lack carinulae, covered only with foveolae; small, triangular process present on postpetiole venter; propodeal spines robust, as long as the basal propodeal face anterior to them; mesosoma, waist, and gaster almost completely devoid of sculpturing.
Minor: propodeal spines more than half as long as the propodeal face anterior to them; body completely devoid of sculpturing, and entirely smooth and shiny.
MEASUREMENTS (mm) Holotype major: HW 0.68, HL 0.60, SL 0.36, EL 0.12, PW 0.32.
Paratype minor: HW 0.32, HL 0.38, SL 0.32, EL 0.06, PW 0.24.
COLOR Major and minor: concolorous dark yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: major, composite of specimens from Mazaruni, Guyana, and Barro Colorado Island, Panama (latter specimen compared with syntype in Emery collection by W. L. Brown). Lower: minor, Barro Colorado Island, Panama. (Type locality: Belém, Pará, Brazil.) Scale bars = 1 mm.

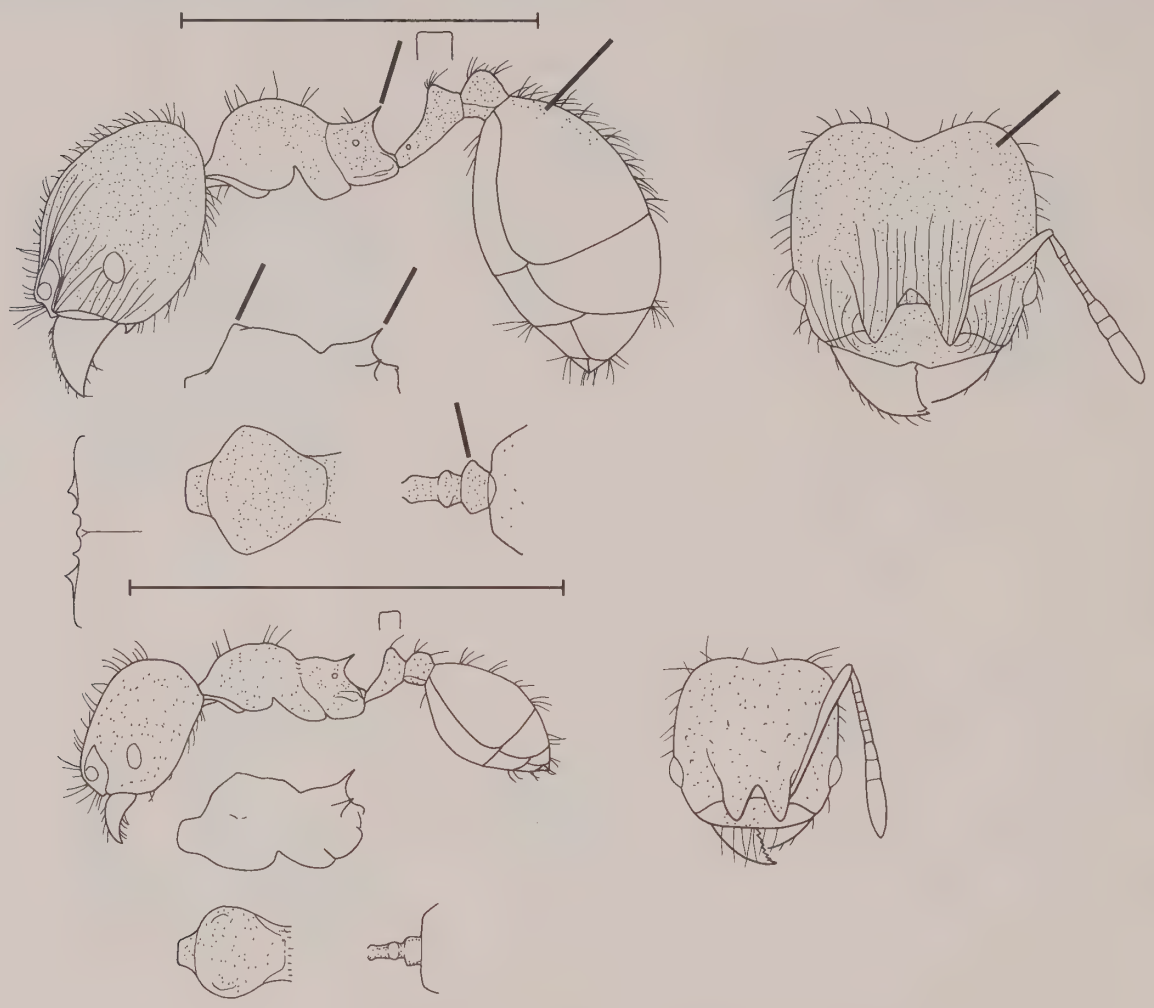


Pheidole perpusilla Emery

Pheidole flavens subsp. *perpusilla* Emery 1894d: 157. Syn.: *Pheidole decem* Forel 1901j: 366, n. syn.; *Pheidole (Hendecapheidole) emersoni* Wheeler 1922f: 4. Raised to species level by Emery 1896g: 80.

TYPES Mus. Civ. Stor. Nat. Genova.
ETYMOLOGY L *perpusilla,* extremely small.
DIAGNOSIS A member of the *perpusilla* group (10-segmented antenna, very small body size), distinguished within the group by the following traits.
Major: dorsum of head except for frontal triangle and mid-clypeus completely covered by longitudinal carinulae; propodeal spines short and stout, less than a third as long as the basal propodeal face anterior to them; first gastral tergite and dorsum of postpetiolar node smooth and shiny; pronotum varies from foveolate (South America) to smooth (Panama).
Minor: all of head and mesosoma foveolate and opaque.
MEASUREMENTS (mm) Major (Mazaruni, Guyana): HW 0.60, HL 0.62, SL 0.26, EL 0.06, PW 0.32.
Minor (syntype of synonymous *emersoni*): HW 0.34, HL 0.38, SL 0.28, EL 0.06, PW 0.26.
COLOR Major: most of body and appendages reddish yellow, gaster medium to dark brown.
Minor: body yellowish brown, appendages in contrasting yellow.
RANGE Recorded from Panama, Guyana, and Pará, Brazil.
BIOLOGY Two colonies in Guyana were found in the abandoned portions of *Nasutitermes* carton nests.

FIGURE Upper: major. Lower: minor. TRINIDAD: Blanchiseusse Road, 10 km marker. Scale bars = 1 mm.

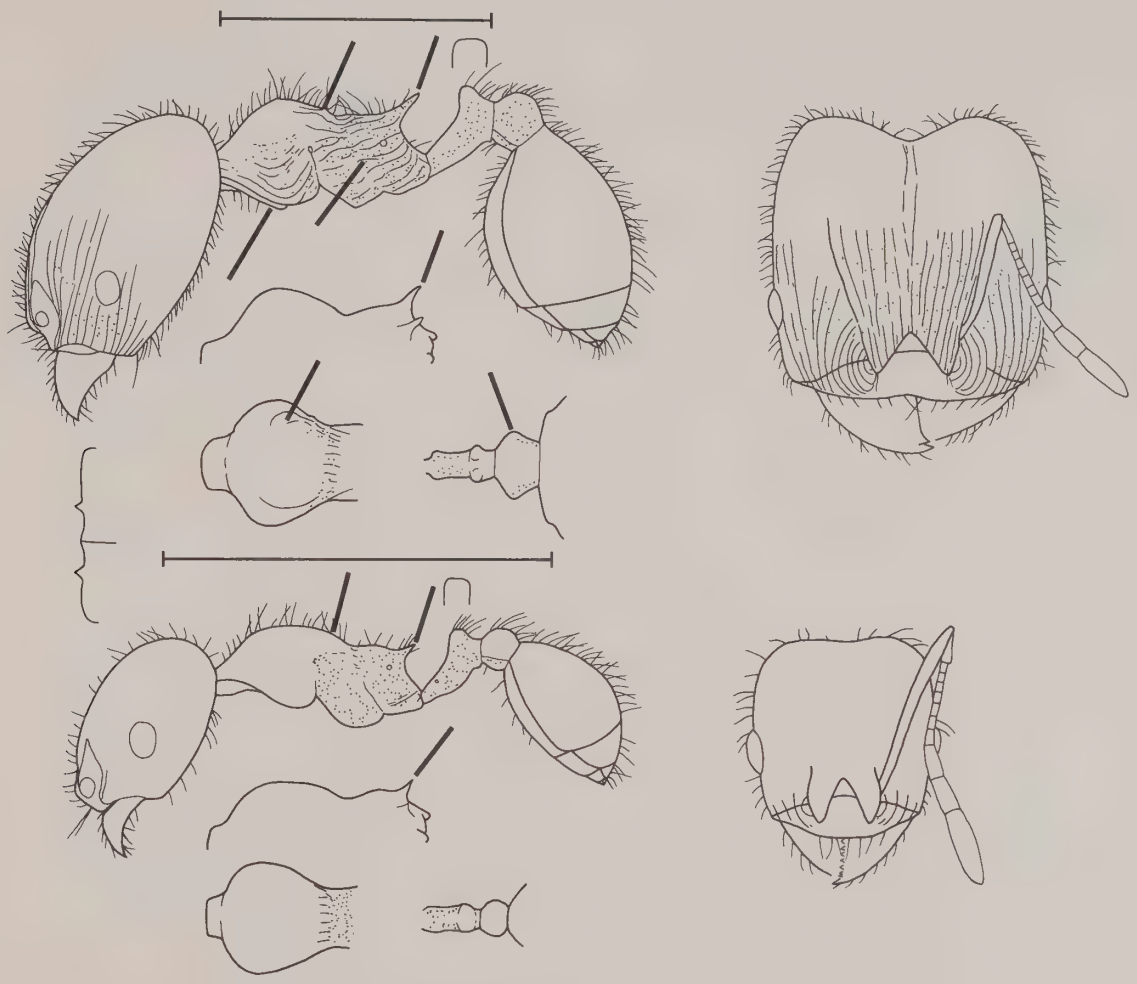


Pheidole zeteki M. R. Smith

Pheidole zeteki M. R. Smith 1947h: 194.

TYPES Nat. Mus. Nat. Hist. U. S.; Mus Comp. Zool. Harvard.
ETYMOLOGY Named after James Zetek, early biologist of the Barro Colorado Field Station.
DIAGNOSIS A member of the *perpusilla* group (very small, with 10-segmented antennae), close to *perpusilla,* and distinguished as follows.
Major: anterior half of dorsum of head mostly covered by longitudinal carinulae, and posterior half foveolate and opaque; propodeal spines long and backward-directed; dorsum of postpetiolar node and anterior half of central strip of first gastral tergite foveolate and opaque.
Minor: all of head and mesosoma foveolate and opaque.
MEASUREMENTS (mm) Major (Trinidad): HW 0.66, HL 0.66, SL 0.34, EL 0.08, PW 0.34.
Minor (Trinidad): HW 0.32, HL 0.36, SL 0.30, EL 0.06, PW 0.24.
COLOR Major: concolorous medium yellow.
Minor: concolorous light reddish yellow.
RANGE Known from single collections on Barro Colorado, Panama; Morne Bleu, Northern Range and the Blanchiseusse Road, Trinidad; Puyo, Pastaza, Ecuador; and Cuzco Amazónico, near Maldonado, Peru.
BIOLOGY The colony found on the Blanchiseusse Road in Trinidad was in montane rainforest, nesting in a very decayed log (Stefan Cover, collection notes).

FIGURE Upper: paratype, major. Lower: paratype, minor. FLORIDA: Gainesville, Alachua Co., Florida (Marcio A. Naves). Scale bars = 1 mm.

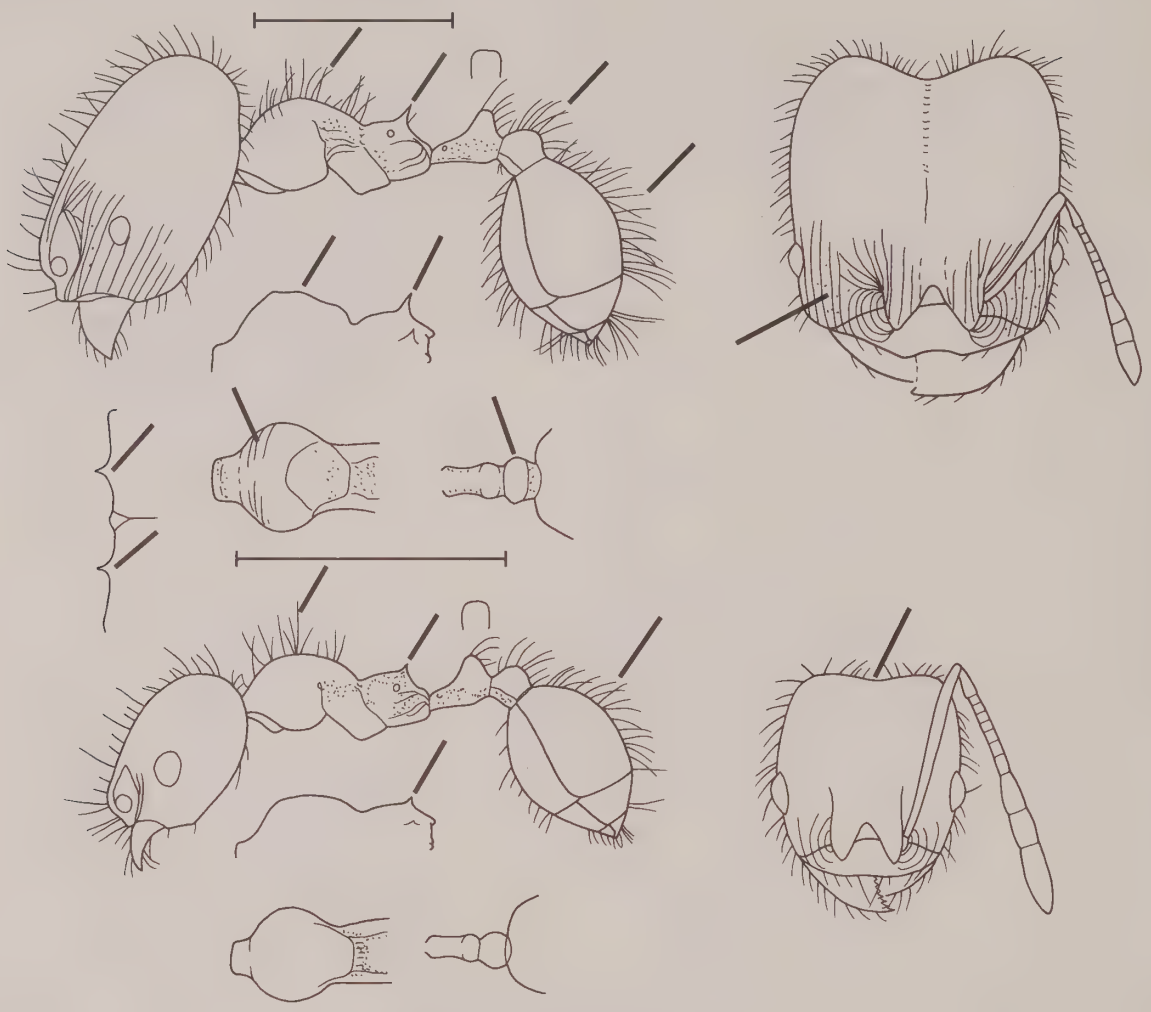


Pheidole adrianoi Naves

Pheidole adrianoi Naves 1985: 56.

TYPES Mus. Comp. Zool. Harvard; Florida State Collection of Arthropods.
ETYMOLOGY Eponymous.
DIAGNOSIS A small brown member of the *pilifera* group distinguished by the following combination of traits.
Major: diminished, nearly invisible mesonotal convexity; metanotal groove absent, with metanotal profile forming a continuous line with that of the propodeal basal face; propodeal spines long, thick, blunt-tipped; mesopleuron and sides of pronotum and propodeum completely covered by longitudinal carinulae, but promesonotal dorsum smooth and shiny; postpetiolar node diamond-shaped viewed from above.
Minor: profile of promesonotal dorsum smoothly convex; propodeal spines short and stout; mesopleuron and side of propodeum foveolate and opaque but lacking carinulae.
Close to *davisi* but differing in the above and other characters.
MEASUREMENTS (mm) Paratype major: HW 0.86, HL 0.92, SL 0.46, EL 0.14, PW 0.44.
Paratype minor: HW 0.38, HL 0.42, SL 0.38, EL 0.10, PW 0.24.
COLOR Major: body mostly plain medium brown, gaster dark brown, appendages yellowish brown.
Minor: body medium to dark brown, appendages medium brown.
RANGE Central and northern Florida, west to Okaloosa Co. in the Florida panhandle.
BIOLOGY Marcio Naves (1985) found *P. adrianoi* common within its range, nesting in sandy soil in clear areas within forests—a habitat also preferred by *P. metallescens,* which resembles it in the field to the naked eye. According to Stefan Cover (personal communication), *adrianoi* is typically associated with white-sand gaps in pine-oak forest. The colonies contain about 60 majors and more than 300 minors. The nest entrance, surrounded by a crater of excavated soil, leads through a vertical tunnel 1–2 mm in diameter to a main chamber 30 to 40 cm beneath the surface. Mature colonies contain about 60 majors and more than 300 minors. Both castes engage in strictly diurnal foraging, and the majors participate in the retrieval of food. The main diet is seeds, although the workers also scavenge for small dead arthropods. The main flights of the winged sexual forms occur in July and August.

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: 24 km southwest of Cintalpa, Chiapas, 710 m (William P. MacKay). Scale bars = 1 mm.



Pheidole agricola new species

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *agricola,* field-dweller, referring to the collection site of the type series.

DIAGNOSIS A distinctive member of the *pilifera* group recognizable by the following combination of traits.

Major: reddish yellow; medium-sized; with dense, very long, erect to suberect pilosity on the dorsal surface of the body; prominent, broad semicircular notch in anterior clypeal border; relatively long, thin propodeal spines, faintly bilobed pronotal profile in dorsal-oblique view; carinulae confined on head to the anterior third, and elsewhere to the anterior half of the pronotal dorsum; rest of body smooth and shiny.

Minor: light brown; pilosity of dorsal surface of body abundant, very long, and erect to suberect; propodeal spines reduced to denticles; body almost completely smooth and shiny.

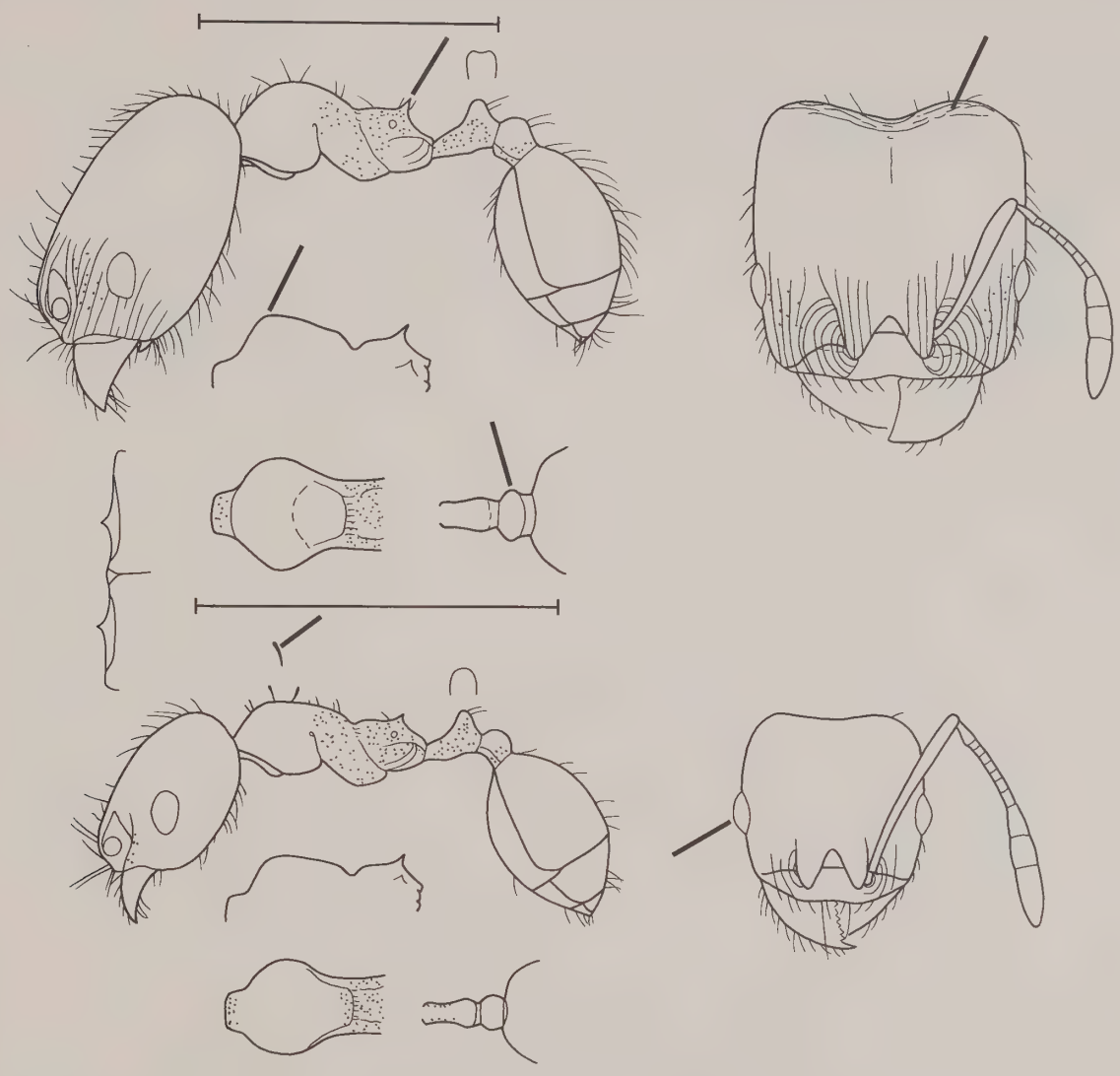
MEASUREMENTS (mm) Holotype major: HW 1.18, HL 1.38, SL 0.66, EL 0.16, PW 0.54.
Paratype minor: HW 0.52, HL 0.60, SL 0.60, EL 0.12, PW 0.34.

COLOR Major: concolorous reddish yellow.
Minor: concolorous light brown.

RANGE Known only from the type locality.

BIOLOGY The colony was found in an agricultural field created by clear-cutting and burning.

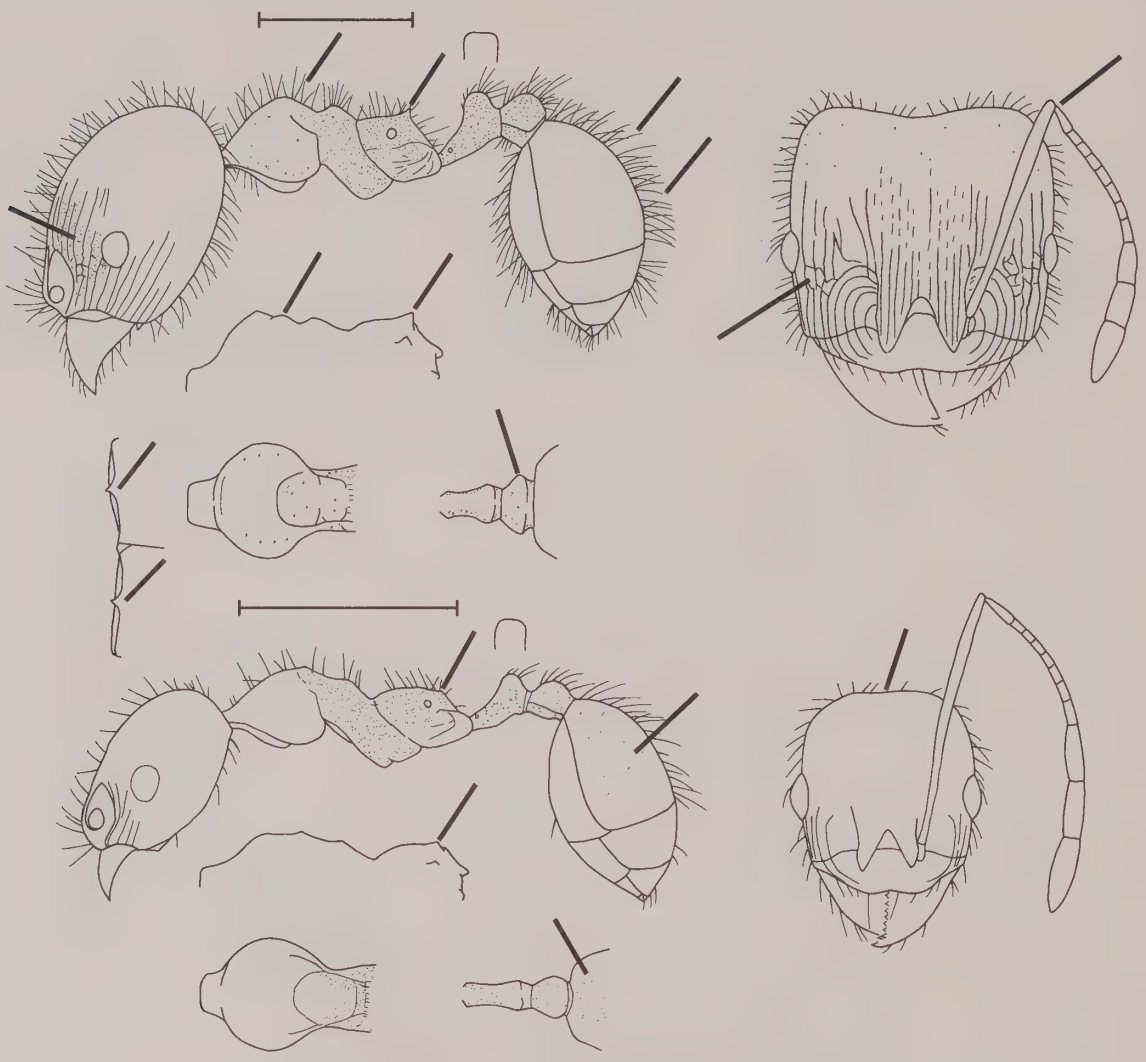
FIGURE Upper: holotype, major. Lower: paratype, minor. TEXAS: 5 km northwest of Eldorado, Schleicher Co. (O. F. Francke). Scale bars = 1 mm.



Pheidole aurea **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *aurea,* gold, referring to the yellow color of both worker castes, and the type locality (El Dorado).
DIAGNOSIS A member of the "*bicarinata* complex" of the larger *pilifera* group, comprising *agricola, aurea, bajaensis, barbata, bicarinata, centeotl, cerebrosior, defecta, gilvescens, macclendoni, macrops, marcidula, paiute, pinealis, psammophila, vinelandica, xerophila, yaqui,* and *yucatana*; which complex is characterized by the large to very large forward-set eyes of both castes; and in the major, the occipital lobes lacking any sculpturing (except in *aurea*); the posterior half of the head capsule almost entirely smooth and shiny; and the postpetiolar node seen from above oval, elliptical, or laterally angulate (cornulate in *cerebrosior*).
P. aurea in particular is distinguished by the following combination of traits.
Major: yellow; occiput with narrow band of transverse rugulae, which do not extend all the way across the occipital lobes; propodeal spines blunt, equilaterally triangular; humerus subangulate in dorsal-oblique view; postpetiolar node elliptical when seen from above.
Minor: clavate hairs present on promesonotal dorsum.
MEASUREMENTS (mm) Holotype major: HW 0.84, HL 0.92, SL 0.50, EL 0.20, PW 0.40.
Paratype minor: HW 0.42, HL 0.48, SL 0.46, EL 0.12, PW 0.26.
COLOR Major: medium yellow, head slightly darker in shade than rest of body.
Minor: concolorous medium yellow.
RANGE Known only from the type locality.
BIOILOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: San Jeronimo, Mexico City (W. Lopez-Forment). Scale bars = 1 mm.



Pheidole azteca **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the ancient Amerindian empire that embraced the type locality.

DIAGNOSIS A member of the *pilifera* group, close to *hamtoni* (in the *fallax* group) of Mexico but distinguished from it and other species of the group by the following combination of traits. Both **major** and **minor** medium reddish yellow.

Major: head capsule in full-face view quadrate, as broad as long; hypostoma with only 2 teeth; propodeal spine reduced to a thick denticle; postpetiolar node from above diamond-shaped, with right-angular lateral margins; pilosity erect and very dense; a patch of rugoreticulum present between each eye and the nearest antennal fossa.

Minor: propodeal spines reduced to rudimentary broad denticles, not even apparent in side view; occiput broad, lacking nuchal collar.

MEASUREMENTS (mm) Holotype major: HW 1.34, HL 1.34, SL 1.14, EL 0.22, PW 0.72.

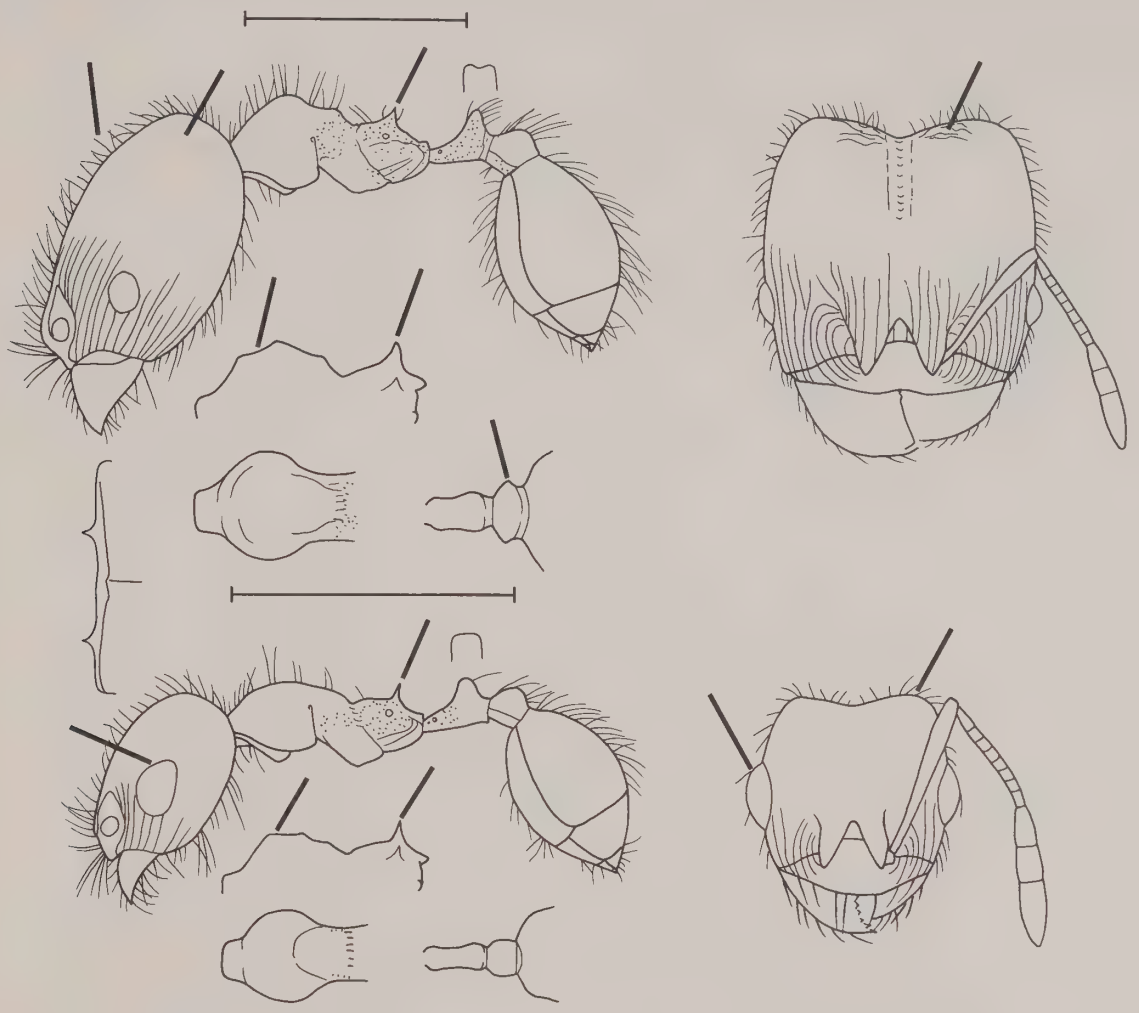
Paratype minor: HW 0.72, HL 0.82, SL 1.02, EL 0.20, PW 0.46.

COLOR Major and minor: body medium yellow with very slight reddish tinge, except for gaster, which is plain pale yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. BAJA CALIFORNIA SUR, MEXICO: 50 km south-southwest of San Ignacio, 26°52′N 113°08′W (Philip S. Ward). Scale bars = 1 mm.

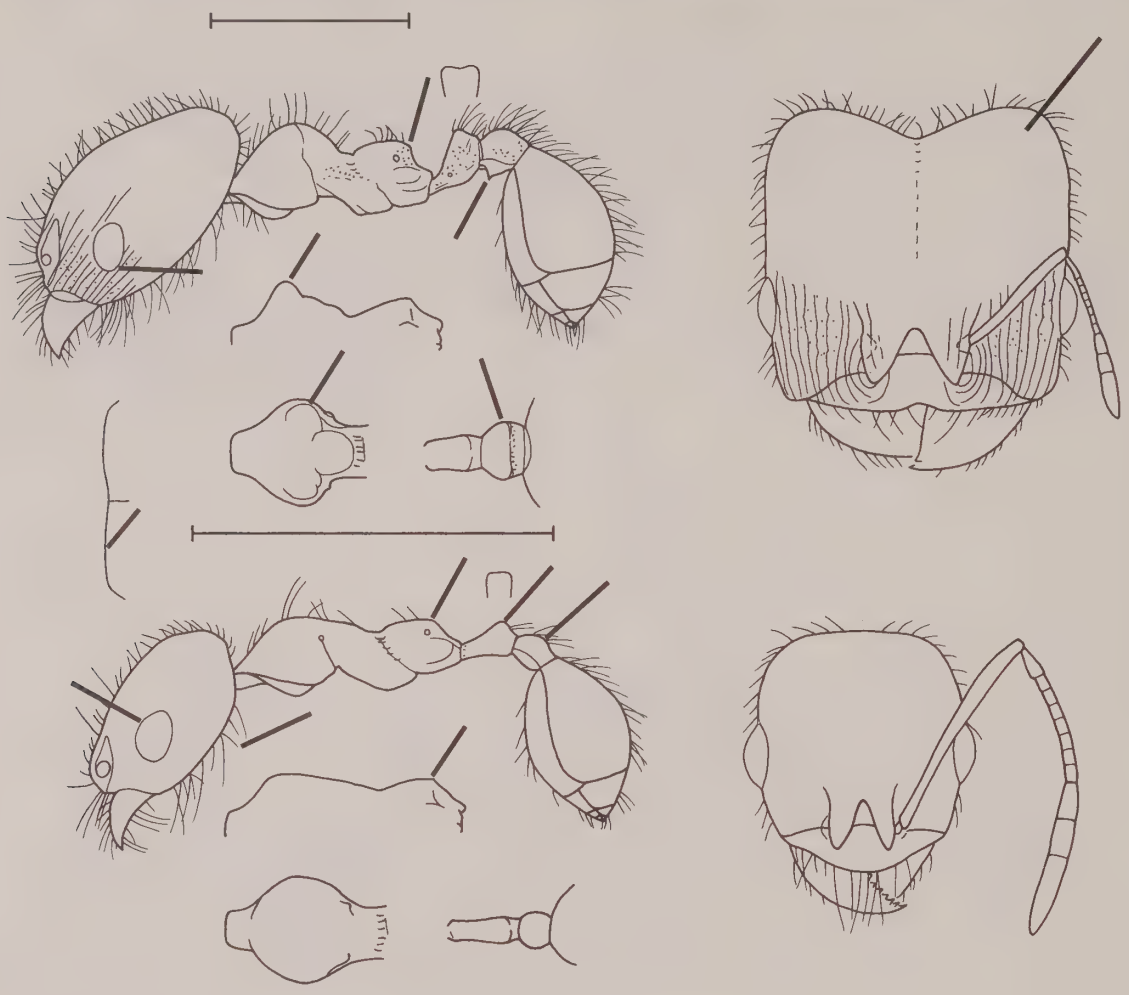


Pheidole bajaensis **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *bajaensis,* named after the Mexican state of origin.
DIAGNOSIS Close to and possibly conspecific with *yaqui,* differing as follows.
Major: occiput rugulose from the midline partly out to the occipital corners; postpetiole laterally subangulate seen from above; margins of anterior half of pronotum not transversely carinulate.
Minor: humerus in dorsal-oblique view less angulate and occipital lobes in full-face view more so, and propodeal spines longer.
Together, *bajaensis* and *yaqui* differ from *gilvescens* and *xerophila* in the **major's** head shape, which in side view is rounded (not flattened) in the dorsal profile of its posterior half, and the failure of the head to taper toward the occiput; other traits exist in major and minor as shown. Philip Ward (personal communication) has pointed out that *yaqui* and *bajaensis* are joined by intermediates in the degree of occipital rugulation, forming what appears to be a southward cline on Baja. He recommends treating the two forms as one species. Ward may be right, but I have hesitated to unite the two forms in view of the presence of other defining traits described here in the Diagnosis.
MEASUREMENTS (mm) Holotype major: HW 1.22, HL 1.26, SL 0.64, EL 0.24, PW 0.52.
Paratype minor: HW 0.54, HL 0.60, SL 0.52, EL 0.20, PW 0.32.
COLOR Major: body and appendages medium yellow except mandibles, which are dark yellow.
Minor: body and appendages medium yellow.
RANGE Known only from Baja California Sur; possibly a geographic variant of *yaqui,* as noted in the Diagnosis above.
BIOLOGY Unknown.

Compare with species listed
in the Diagnosis below

FIGURE Upper: major. CALIFORNIA: Rancho Dos Palmas, east of the Salton Sea.
Lower: minor, syntype. (Type locality, origin of minor: Mojave Desert near Needles, San Bernadino Co.). Scale bars = 1 mm.

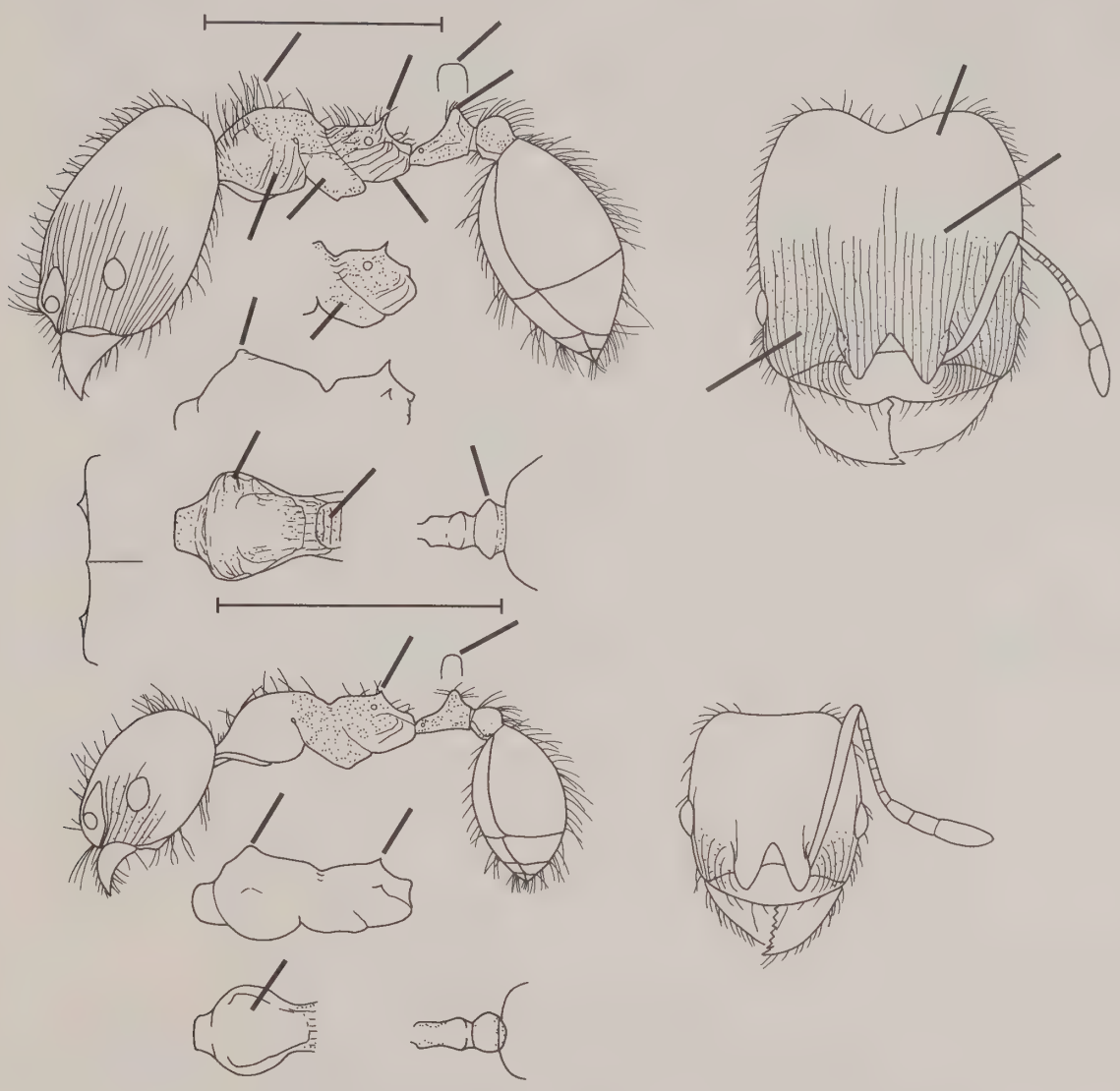


Pheidole barbata Wheeler

Pheidole barbata Wheeler 1908h: 448.

TYPES Amer. Mus. Nat. Hist.; Mus. Comp. Zool. Harvard.
ETYMOLOGY L *barbata,* bearded, alluding to the long, coarse hairs on the ventral head surface of the minor.
DIAGNOSIS A member of the "*bicarinata* complex" of the larger *pilifera* group, comprising *agricola, aurea, barbata, bicarinata, centeotl, cerebrosior, defecta, gilvescens, macclendoni, macrops, marcidula, paiute, pinealis, psammophila, vinelandica, xerophila, yaqui,* and *yucatana (barbata* is closest to *psammophila),* which complex is characterized by the large to very large, forward-set eyes of both castes; and, in the **major**, the occipital lobes lacking any sculpturing (except in *aurea*), the posterior half of the head capsule smooth and shiny; and the postpetiolar node seen from above oval, elliptical, or laterally angulate (cornulate in *cerebrosior*).
P. barbata is distinguished by the absence of propodeal spines in both castes. Further: in the **major**, teeth absent on the hypostoma; humerus very prominently lobose in dorsal-oblique view; and spinose subpetiolar process seen in side view.
Minor: very long coarse hairs (psammophore?) line the ventral surface of the head; petiolar and postpetiolar nodes very low.
MEASUREMENTS (mm) Major (Rancho Dos Palmas, California): HW 1.62, HL 1.72, SL 0.74, EL 0.26, PW 0.72.
Syntype minor: HW 0.44, HL 0.54, SL 0.52, EL 0.18, PW 0.30.
COLOR Major: head brownish yellow, with occiput and area around midcenter line light brown; mesosoma, waist, and antennae brownish yellow; legs medium yellow.
Minor: concolorous light yellowish brown.
RANGE Western Arizona, southern Nevada, and southeastern California (Creighton and Gregg 1955; G. C. and J. N. Wheeler 1973e, 1986g).
BIOLOGY According to Creighton and Gregg (1955), *barbata* is a desert species, which prefers to nest in light, sandy soil, although it also lives in coarse, hard-packed sand along the edges of arroyos. The nest is surmounted by a low crater 5–10 cm in diameter, and it is sometimes also surrounded by a chaff ring, suggesting that *barbata* is a harvester ant. Colonies excavated by Creighton comprised up to 11 majors and 73 minors, although this may be an underestimate of the real population size, since no nest queen was ever found. Similar nest structures were encountered in Deep Canyon, near Palm Springs, California, by G. C. and J. N. Wheeler (1973e).

FIGURE Upper: "typical" *bicarinata* major. Lower: "typical" *bicarinata* minor. INDIANA: Brown County State Park (Edward O. Wilson). (Lower propodeum is of *"vinelandica"* variant major from Calvert Cliffs State Park, Calvert Co., Maryland; see description of other variation in Diagnosis and Color below.) Scale bars = 1 mm.



Pheidole bicarinata Mayr

Pheidole bicarinata Mayr 1870b: 989. Syn.: *Pheidole bicarinata* r. *vinelandica* Forel 1886b: xlv, raised to species level by Naves 1985: 66, n. syn; *Pheidole vinelandica* var. *longula* Emery 1895d: 292, n. syn. (types examined by author); *Pheidole vinelandica* subsp. *laeviuscula* Emery 1895d: 292, synonymy by Creighton 1950a: 172; *Pheidole vinelandica* subsp. *buccalis* Wheeler 1908h: 454, synonymy by Cole 1956c: 114; *Pheidole vinelandica* subsp. *longula* var. *castanea* Wheeler 1915b: 405, unavailable name inomial), referred to *vinelandica*, hence *bicarinata* in this treatment, by Creighton 1950a: 171; *Pheidole (Allopheidole) vinelandica* var. *nebracensis* Forel 1922b: 92, synonymy by Gregg 1959: 18; *Pheidole hayesi* M. R. Smith 1924d: 251, synonymy by Creighton 1950a: 171; *Pheidole vinelandica* subsp. *longula* var. *huachucana* M. R. Smith 1951c: 805, unavailable name (quadrinomial), material referred to *buccalis,* hence synonymous with *bicarinata* in the present treatment, by M. R. Smith 1958c: 120.

TYPES Naturhist. Mus. Wien.

ETYMOLOGY L *bicarinata,* double-ridged, two-carinal, possibly referring to the carinae of the clypeus.

DIAGNOSIS A member of the "*bicarinata* complex" belonging to the larger *pilifera* group, comprising *agricola, aurea, bajaensis, barbata, bicarinata, centeotl, cerebrosior, ceres, defecta, macclendoni, marcidula, paiute, pinealis, psammophila, xerophila, yaqui,* and *yucatana,* which complex is characterized by the large to very large, forward-set eyes, of both castes; and in the major, the occipital lobes lacking any sculpturing (except in *aurea*), the posterior half of the head capsule smooth and shiny; and the postpetiolar node seen from above oval, elliptical, or laterally angulate (cornulate in *cerebrosior*).

P. bicarinata is distinguished within the complex by the following combination of traits.

Major: humerus in dorsal-oblique view dentate to subangulate; propodeal spine moderately long and stout; petiolar node in side view tapered; lateral margins of postpetiolar node seen from above acute-angular; anterior fringe of pronotal dorsum transversely carinulate,

remainder mostly smooth and shiny; lateral margins of pronotal dorsum carinulate or not; mesonotal dorsum foveolate and opaque to mostly smooth and shiny; dorsum of propodeum foveolate and opaque and carinulate or not.

Minor: humerus in dorsal-oblique view obtusely subangulate; petiole variable in size and shape, from small and equilaterally triangular to moderately elongate.

P. bicarinata is a taxonomically difficult species (or, possibly, complex of closely similar species). It is highly variable, especially geographically, in propodeal and pronotal sculpturing, and as suggested above, in development of the propodeal spine, and in color. The variation among different characters is discordant to some degree, and intermediates within the respective characters occur. I believe it prudent for the present to leave the described infraspecific forms as a single species (I am indebted to Philip S. Ward for valuable information and advice on the variation and status of *bicarinata*).

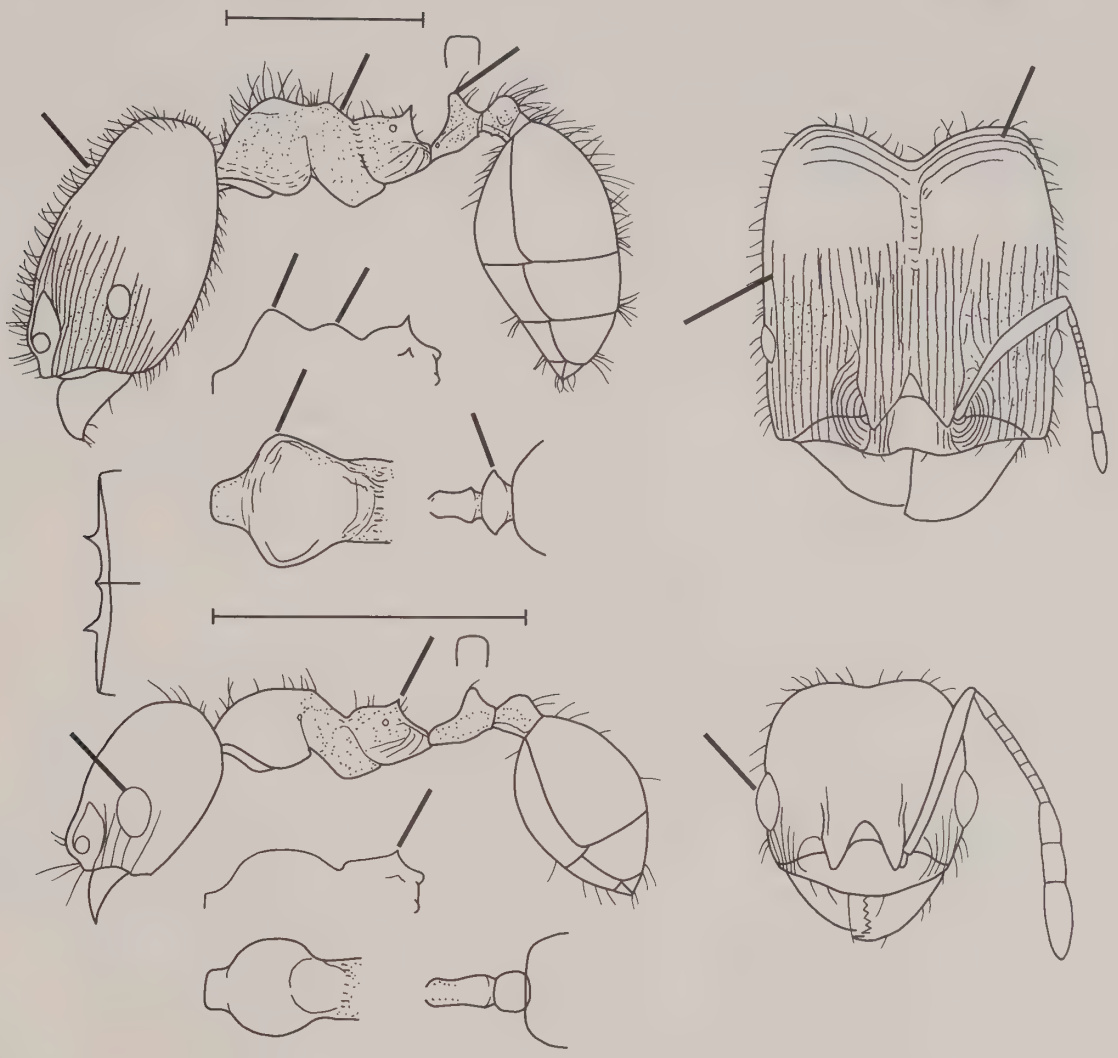
MEASUREMENTS (mm) Major (Brown Co. State Park, Indiana): HW 1.04, HL 1.14, SL 0.54, EL 0.14, PW 0.52.
Minor (Brown Co. State Park): HW 0.54, HL 0.58, SL 0.50, EL 0.12, PW 0.34.

COLOR Major: body varying geographically, from clear yellow in the western parts of the range to brownish yellow to dark brown in the east.
Minor: clear yellow to medium brown.

RANGE New Jersey to northern Florida and west through Nebraska, Colorado, and Texas to Utah and Nevada.

BIOLOGY *P. bicarinata* is highly adaptable across its range in both habitat and nest site. In Colorado, Gregg (1963) recorded *bicarinata* between 1000 and 2100 m, nesting in rotten logs as well as various types of soil beneath stones. The habitats occupied were very diverse, comprising pinyon-cedar and mixed deciduous woodland, canyon-bottom meadows, shortgrass prairie, and sagebrush desert. In Utah and Nevada, *bicarinata* occurs from sagebrush desert to montane woodland, nesting under stones and pieces of wood, as well as crater nests in open soil (Ingham 1959, 1963; Cole 1966b; Allred and Cole 1979). In western Texas, it has been found in xeric habitats in open soil and under stones, cow dung, a bale of hay, and in cracks in asphalt. Beck et al., studying scavenging ants of Utah, observed workers feeding on dead rodents. Males were found in one Colorado nest in early July. In the eastern United States the species favors sandy soils with some clay content. It is often abundant in open, disturbed grassy areas, such as lawns, golf courses, and abandoned fields (Stefan Cover, personal communication). It is omnivorous in diet, and regularly harvests seeds. Diana E. Wheeler and Frederik Nijhout used *bicarinata* in their pioneering studies to demonstrate the role of juvenile hormone in the determination of the major and minor subcastes; they traced development through four larval instars (see D. E. Wheeler 1991).

FIGURE Upper: syntype, major. Lower: syntype, minor. MEXICO: Aguascalientes (W. M. Wheeler). Scale bars = 1 mm.

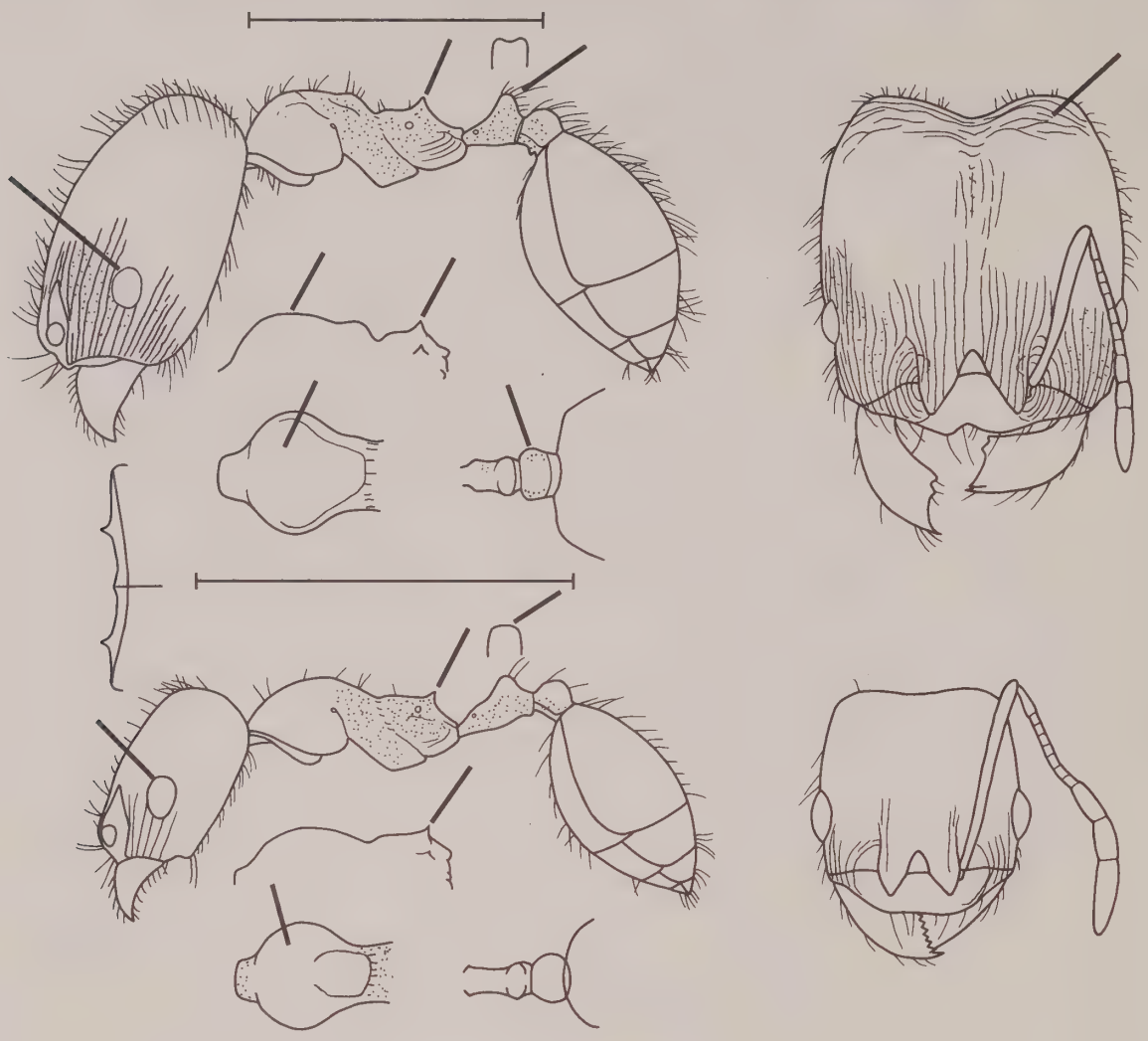


Pheidole calens Forel

Pheidole carbonaria r. *calens* Forel 1901d: 130. Raised to species level by Kempf 1972b: 188.

TYPES Mus. Hist. Nat. Genève; Mus. Comp. Zool. Harvard.
ETYMOLOGY Unknown.
DIAGNOSIS A member of the "*pilifera* complex" of the larger *pilifera* group, comprising *calens, californica, carrolli, cavigenis, clementensis, creightoni, hoplitica, littoralis, micula, pilifera, polymorpha, rugulosa, senex, soritis, tepicana,* and *torosa,* which complex is characterized by the following traits. Major: dorsal head surface extensively sculptured; occipital lobes horizontally rugulose (or, in *carrolli* smooth, in *littoralis* foveate, and in *micula* and *soritis* carinulate); postpetiole from above diamond-shaped, trapezoidal, or spinose. Minor: eye medium-sized to large.
P. calens is distinguished within this complex by the following combination of traits.
Major: posterior dorsal profile of head weakly concave; humerus in dorsal-oblique view prominent and sub-rectangular; mesonotal convexity prominent; petiolar node in side view thin; postpetiole from above laterally spinose.
Minor: eyes very large; propodeal spine in side view equilaterally triangular.
MEASUREMENTS (mm) Syntype major: HW 1.30, HL 1.50, SL 0.64, EL 0.14, PW 0.66.
Syntype minor: HW 0.56, HL 0.64, SL 0.50, EL 0.20, PW 0.34.
COLOR Major: concolorous light reddish brown.
Minor: body concolorous plain medium brown, mandibles yellow, legs light brown.
RANGE Known only from the type locality.
BIOLOGY *P. calens* appears to be a commensal of the large harvesting ants in the genus *Pogonomyrmex*. Wheeler (1901h), in his notes to Auguste Forel on the type series, reported as follows: "This feeble *Pheidole* was found in a number of instances inhabiting small nests within the precincts of the *Pogonomyrmex* colonies, either on the denuded disks or on the slopes of the gravel cones near the entrances of the agriculturals. It was seen more frequently in this association than either *Dorymyrmex pyramicus* or *Forelius maccooki,* and was not seen nesting by itself as is very frequently the case with these species."

FIGURE Upper: major. Lower: minor. CALIFORNICA: Palo Alto. Type locality: San Francisco. Scale bars = 1 mm.



Pheidole californica Mayr

Pheidole californica Mayr 1870b: 987. Syn.: *Pheidole oregonica* Emery 1895d: 291, n. syn.; *Pheidole californica* var. *incenata* Wheeler 1915b: 407, synonomy by Creighton 1950a:173; *Pheidole californica* var. *satura* Wheeler 1915b: 407, synonomy by Creighton 1950a: 173; *Pheidole californica* subsp. *pyramidensis* Emery 1922c: 105 (replacement name for *nevadensis* Wheeler 1915b: 408, junior primary homonym of *Pheidole nevadensis* Forel 1901j: 353), synonomy by G. C. and J. Wheeler 1986g: 18; *Pheidole californica* var. *shoshoni* Cole 1933b: 618, synonomy by Gregg 1959: 1–9; *Pheidole californica* var. *hagermani* Cole 1936a: 35, synonomy by Creighton 1950a:173.

TYPES Naturhist. Mus. Wien.

ETYMOLOGY Based on the state of origin of the type series.

DIAGNOSIS A member of the "*pilifera* complex" of the larger *pilifera* group, comprising *calens, californica, carrolli, cavigenis, clementensis, creightoni, hoplitica, littoralis, micula, pilifera, polymorpha, rugulosa, senex, soritis, tepicana,* and *torosa,* which complex is characterized by the following traits. Major: dorsal head surface extensively sculptured; occipital lobes horizontally rugulose (or, in *carrolli* smooth, in *littoralis* foveate, and in *micula* and *soritis* carinulate); postpetiole from above angulate and trapezoidal to spinose. Minor: eye medium-sized to large.

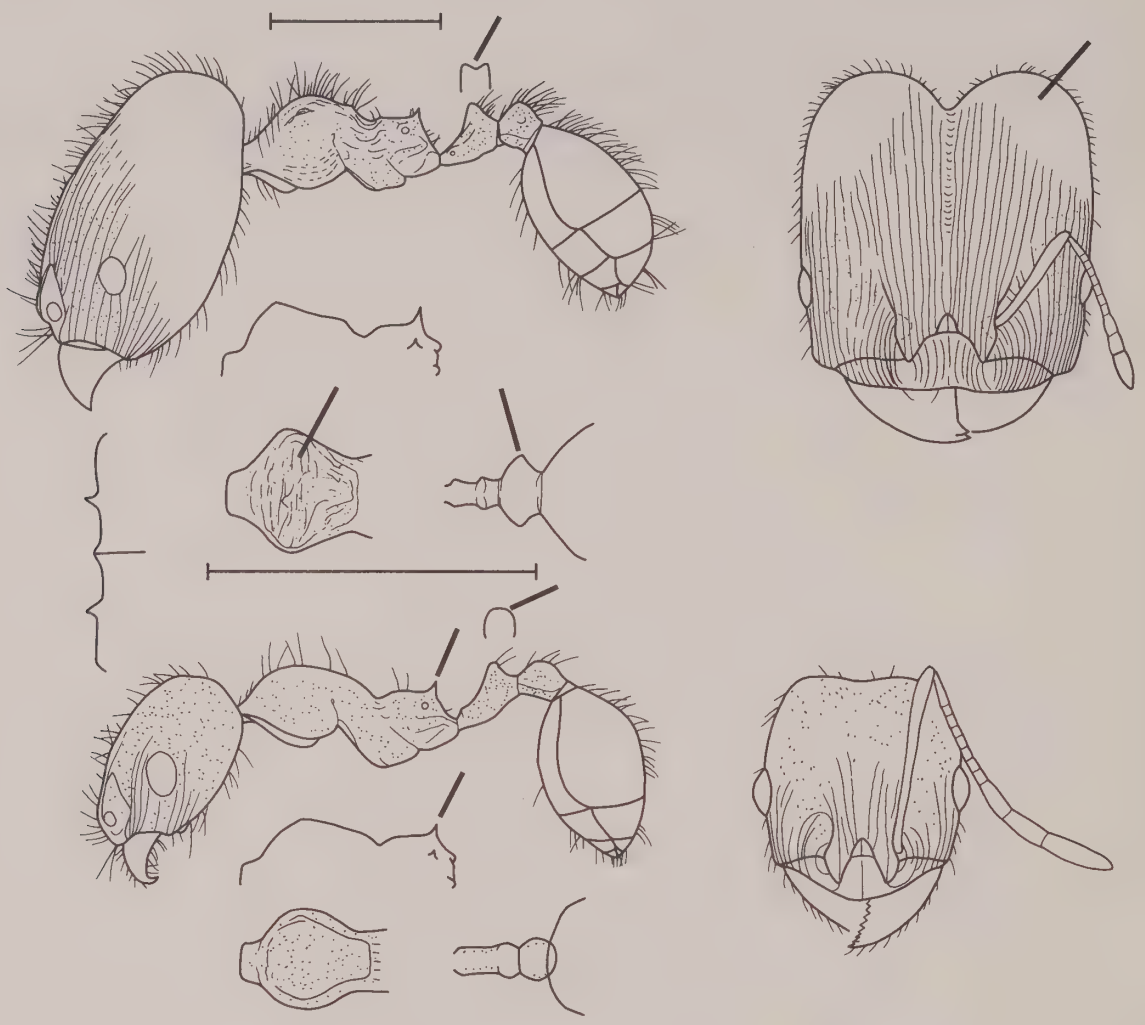
P. californica is distinguished within this complex by the following combination of traits. Color yellow.

Major: all of pronotum smooth and shiny; humerus in dorsal-oblique view low and smoothly convex; propodeal spine in side view equilaterally triangular; postpetiole from above trapezoidal. Closest to *clementensis,* from which it differs by its smaller size (HW in *californica* major about 0.90 mm, in *clementensis* major about 1.10 mm) and proportionately larger eye (major EL/HW 0.20 in *californica* versus 0.13 in *clementensis*). Also, the sides of the major head are smooth and shiny in some, but not all, *californica* populations (Philip S. Ward, personal communication).

MEASUREMENTS (mm) Major (Palo Alto, California): HW 0.92, HL 1.06, SL 0.54, EL 0.18, PW 0.44.
Minor (Palo Alto): HW 0.48, HL 0.56, SL 0.48, EL 0.12, PW 0.28.
COLOR Major: concolorous yellow; gaster a slightly contrasting brownish yellow.
Minor: yellow with a slight brownish tinge.
RANGE California north to Washington, east to Idaho and New Mexico.
BIOLOGY Colonies have been found nesting variously under objects, in oak galls, or in open sandy soil (Cole 1934b; Mallis 1941). Stefan Cover reports a population in moist spots in a grazed Chihuahuan desert at 1295 m in Hidalgo, extreme southwest New Mexico. The colonies were nesting in soil with a high clay content; the most common other ant species was *Leptothorax pergandei.*

Compare with *pilifera*

FIGURE Upper: holotype, major. Lower: paratype, minor. FLORIDA: Gainesville, Alachua Co. (Marcio A. Naves). Scale bars = 1 mm.

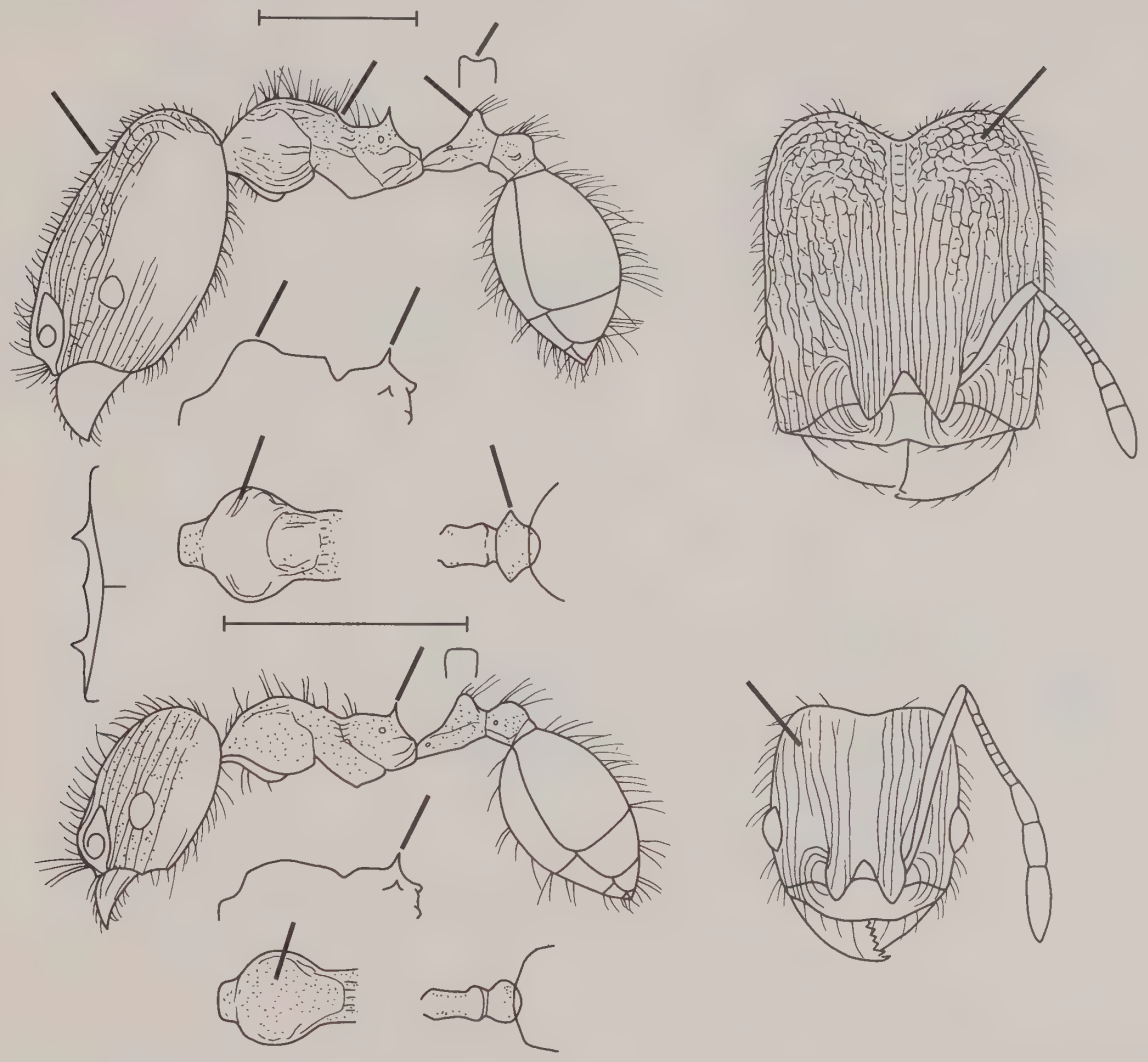


Pheidole carrolli Naves

Pheidole carrolli Naves 1985: 58.

TYPES Florida State Collection of Arthropods; Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after James F. Carroll, collector of part of the type series.
DIAGNOSIS A member of the "*pilifera* complex" of the larger *pilifera* group; for a characterization of the complex, see under *pilifera*. Very close to *pilifera* itself (q.v.), and differing as follows. The only consistent distinction is the orange color of *carrolli* versus the browns, yellowish browns, and reddish browns of the highly variable, more northern distributed *pilifera*. In addition the **major** of *carrolli* has occiput and dorsal surface of postpetiole completely smooth, but this trait also occurs in some *pilifera* series.
MEASUREMENTS (mm) Holotype major: HW 0.56, HL 1.82, SL 0.70, EL 0.24, PW 0.68.
Paratype minor: HW 0.52, HL 0.58, SL 0.54, EL 0.14, PW 0.32.
COLOR Major: "orange," i.e., concolorous brownish yellow with a slight reddish tinge.
Minor: concolorous yellowish brown, head a slightly darker shade of light brown.
RANGE Known from Alachua, Citrus, and Leon Counties in northern Florida.
BIOLOGY Naves (1985) found *carrolli* only in the shaded, sandy soil of tall oak or pine woodland. Subsequent collection by Stefan Cover and Lloyd Davis Jr. have securely identified *carrolli* as an early successional species that occurs in open, often disturbed habitats with sandy soil. Colonies are vigorous and consist of several hundred ants, including several dozen soldiers. Naves' collections may represent moribund colonies in poor nest sites, or colonies about to be eliminated by shading of formerly open habitats. The colonies are small, with only one or two majors present. According to Naves, no more than 15 minors forage at a time, and then singly and mostly at dusk and in the morning, for distances not exceeding 5 meters from the nest entrance. The entrance is difficult to spot and leads to exceptionally deep vertical galleries, in one case extending 1.7 m from the surface. A seed-filled granary chamber approximately 4 × 2 × 2 cm in size is present usually at a depth of 30 cm. The minor workers are exceptionally sluggish, and show the unusual, perhaps unique habit for *Pheidole* of feigning death when disturbed, often curling themselves around particles of soil in a way that makes them even more difficult to see.

FIGURE Upper: major. Lower: minor. ARIZONA: 11 km west-northwest of Montezuma Pass, Huachuca Mts., Cochise Co., 1660 m (Stefan Cover). Scale bars = 1 mm.



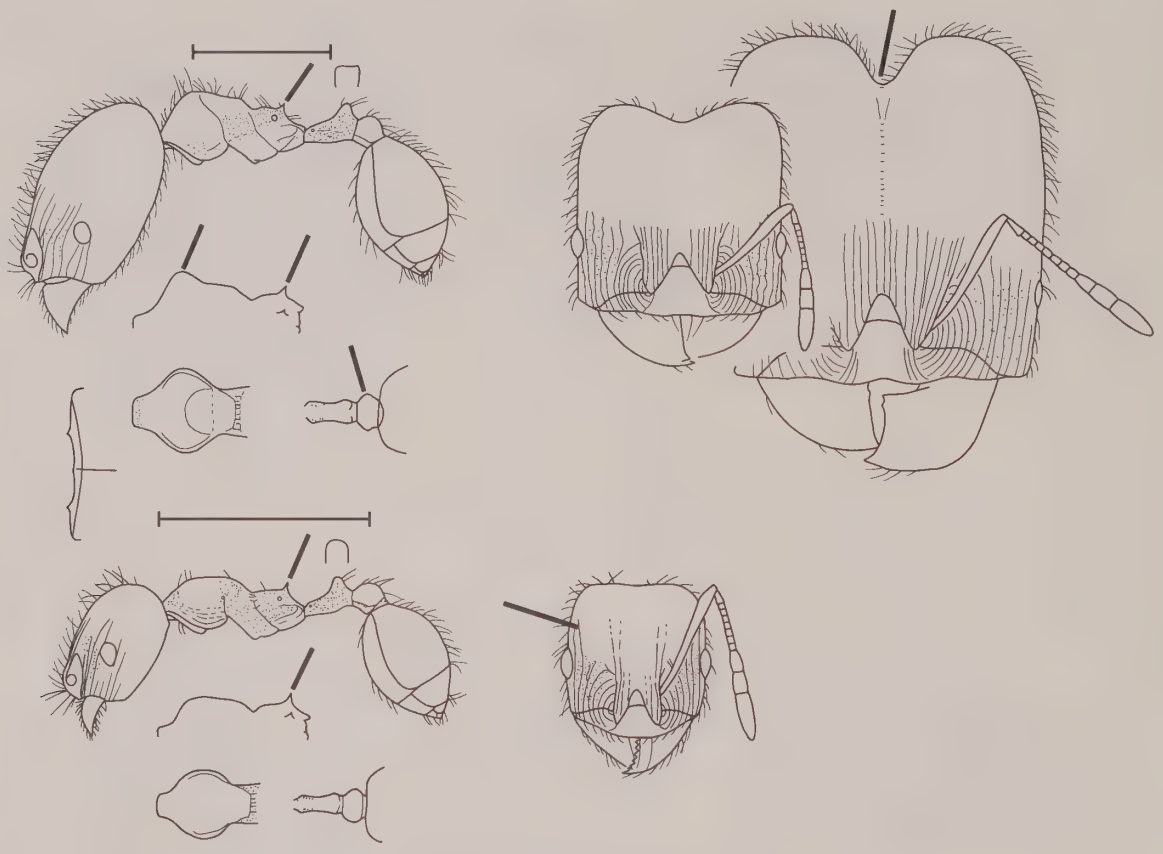
Pheidole cavigenis Wheeler, **new status**

Pheidole tepicana subsp. *cavigenis* Wheeler 1915b: 403.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *cavigenis,* hollow cheek, significance unknown.
DIAGNOSIS A member of the "*pilifera* complex" of the larger *pilifera* group; for a characterization of the complex, see under *pilifera*. *P. cavigenis* is distinguished within the complex by the following combination of traits.
Major: occiput and extensive dorsal surface anterior to the occiput rugoreticulate; a small patch of rugoreticulum is present just posterior to each antennal fossa; humerus very prominent and lobose in dorsal-oblique view; mesonotal convexity absent, but mesonotum descends abruptly to the metanotal groove; propodeal spines long and thin; postpetiole spinose.
Minor: almost all of dorsal head surface longitudinally carinulate; propodeal spine needle-shaped.
MEASUREMENTS (mm) Major (Montezuma Pass, Arizona): HW 1.60, HL 1.86, SL 0.74, EL 0.22, PW 0.76.
Minor: HW 0.62, HL 0.66, SL 0.62, EL 0.12, PW 0.40.
COLOR Major: body light reddish brown, mandibles and gaster plain medium brown.
Minor: head and gaster medium brown, mesosoma and appendages light brown.
RANGE Known from several collections in the Huachuca Mts; thence west to Sycamore Canyon in the Pajarito Mts., about 20 miles west of Nogales (Stefan Cover). A series in the Museum of Comparative Zoology from Bocoyna, Chihuahua, belongs to this species but with some differences; it may represent a geographical variant.
BIOLOGY According to Stefan Cover, who has collected intensively within the range of *cavigenis,* this species occurs in grassy gaps in juniper-oak-pinyon woodlands at mid-elevations. Nests are cryptic and seeds are sometimes found inside. Colonies appear to consist of no more than 200–300 individuals.

Compare with *macclendoni*

FIGURE Upper: lectotype, major (body and full head), next to paralectotype, supermajor (partial head only). Lower: paralectotype, minor. MEXICO: Molino Guerrero (Guerrero Mill), Hidalgo, 2600–2900 m (William M. Mann). Scale bars = 1 mm.

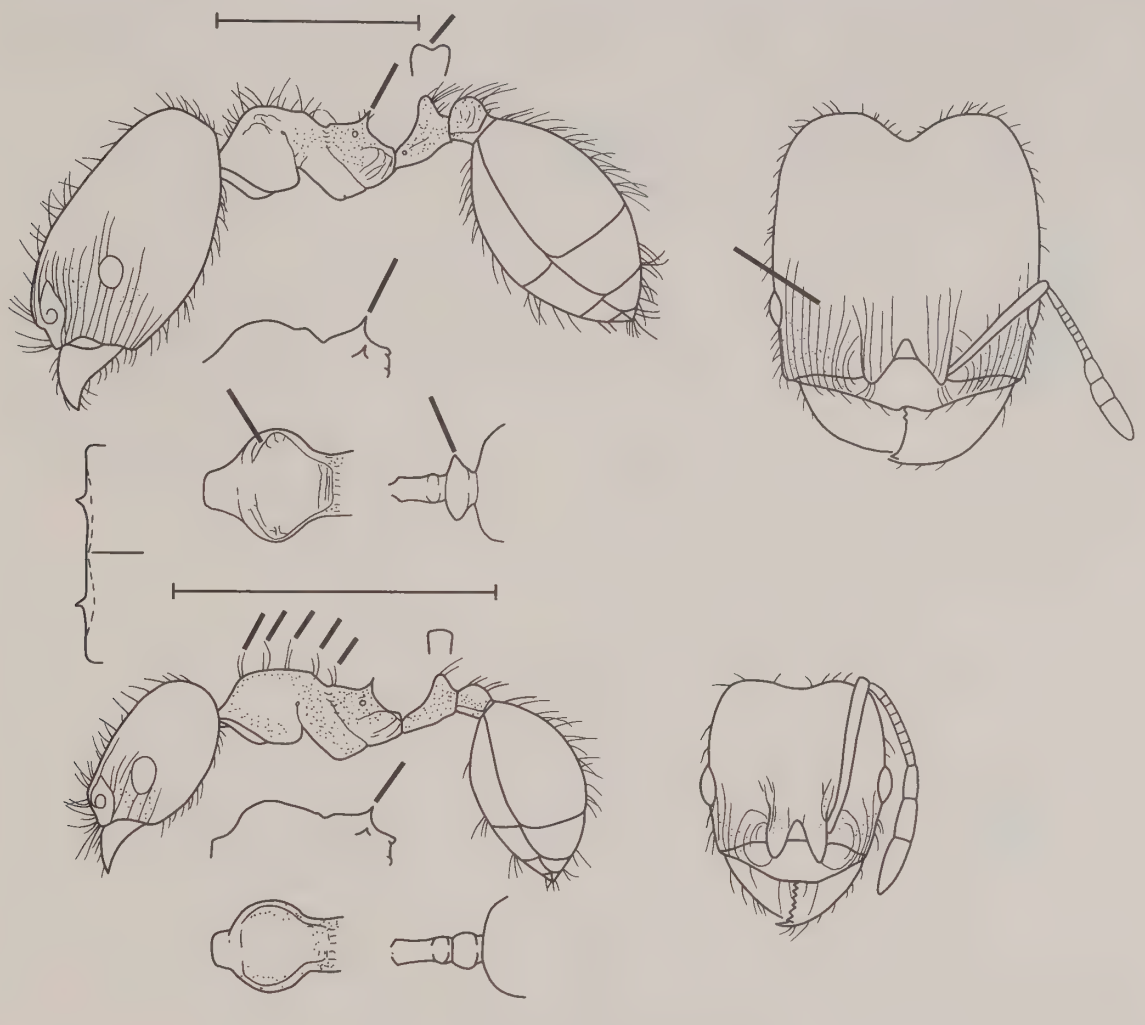


Pheidole centeotl Wheeler

Pheidole centeotl Wheeler 1914c: 46.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Unknown.
DIAGNOSIS A member of the *pilifera* group with 3 worker castes (major, supermajor, minor) similar to *macclendoni* of Arizona and Texas, differing as follows.
Major: propodeal spines much shorter; humerus in dorsal-oblique view less prominent; postpetiolar node seen from above subangulate and diamond-shaped; light reddish brown, not yellow.
Supermajor: occipital cleft deeper, its sides rising more steeply to the occipital lobes on either side.
Minor: propodeal spine well-developed; carinulae present on frontal lobes, and those mesad to the eye extend posteriorly beyond the eye by as much as an Eye Length.
MEASUREMENTS (mm) Lectotype major: HW 1.10, HL 1.20, SL 0.62, EL 0.14, PW 0.56.
Paralectotype supermajor: HW 1.84, HL 2.06, SL 0.80, EL 0.22, PW 0.80.
Paralectotype minor: HW 0.60, HL 0.66, SL 0.56, EL 0.12, PW 0.38.
COLOR Major: body light to medium reddish brown, appendages light reddish brown.
Supermajor: light to medium reddish brown.
Minor: concolorous light reddish brown.
RANGE I have seen series of *centeotl* from the following central and southeastern states of Mexico: Hidalgo, Michoacán, Morelos, Puebla, and Veracruz, all collected at elevations of 2200–2400 m.
BIOLOGY Mann (in Wheeler 1914c) found numerous colonies of this species nesting under stones on a hillside in oak-pine woodland near Molino Guerrero (an ore mill), on the eastern slope of the mountain range east of Pachuca. A colony collected by Robert J. Hamton near Jalapa, Veracruz, was nesting beneath a stone in pine forest at 2350 m. Winged reproductives were in a nest at 2200 m near Cuernavaca on 26 May 1986 (W. P. MacKay).

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ARIZONA: Tucson. Scale bars = 1 mm.

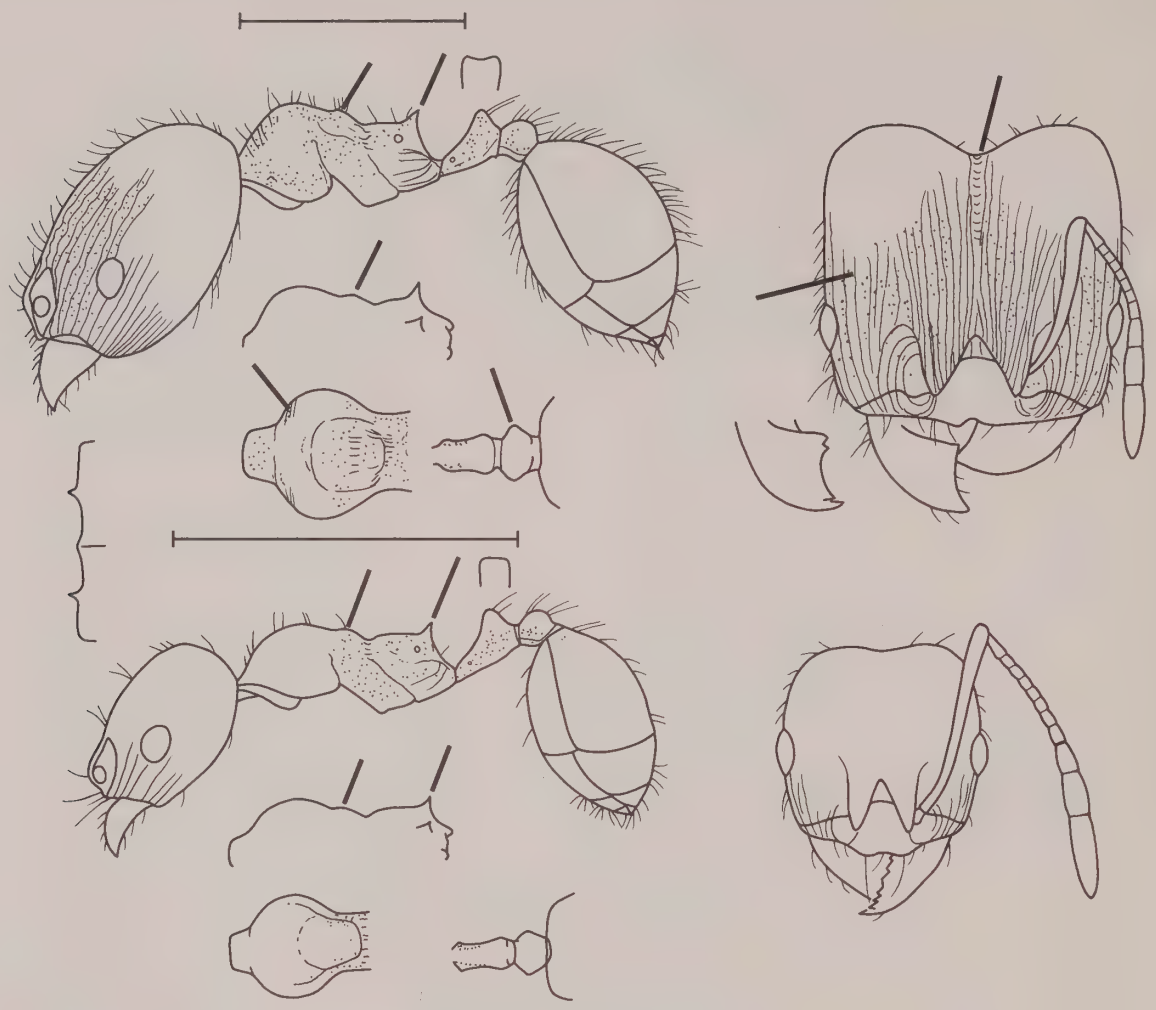


Pheidole cerebrosior Wheeler

Pheidole vinelandica subsp. *cerebrosior* Wheeler 1915b: 405. Raised to species level by Creighton 1950a: 175.

TYPES Amer. Mus. Nat. Hist.; Mus. Comp. Zool. Harvard.
ETYMOLOGY Unknown.
DIAGNOSIS A member of the "*bicarinata* complex" of the larger *pilifera* group; for a characterization of the complex, see under *bicarinata*.
P. cerebrosior is distinguished within the complex by the following combination of traits.
Major: postpetiole seen from above very wide and conulate; propodeal spines well-developed and backward-directed; pronotal humeri with short irregular carinulae.
Minor: mesosomal pilosity comprises rows of evenly spaced pairs of erect hairs.
MEASUREMENTS (mm) Lectotype major: HW 1.12, HL 1.32, SL 0.60, EL 0.14, PW 0.58.
Paralectotype minor: HW 0.46, HL 0.56, SL 0.44, EL 0.12, PW 0.28.
COLOR Major: body light reddish yellow, except for the gaster, which is a slightly contrasting yellowish brown.
Minor: concolorous plain yellow.
RANGE Arizona and New Mexico, 550 to 1680 m; southern California, 950 m; Baja California, 640 m; Chihuahua, 1500 m (Creighton and Gregg 1955); numerous records by Stefan Cover (collection notes) and extreme southern Nevada (G. C. and J. Wheeler 1986g).
BIOLOGY Creighton and Gregg (1955) report that the preferred habitat of *cerebrosior* is evergreen-oak-woodland in mountain canyons, with open desert less frequently occupied. The colonies are always small, and contain no more than 3 or 4 majors. Stefan Cover (unpublished specimen data) found numerous colonies in open *Ephedra,* mesquite, and mesquite-acacia desert, as well as riverine cottonwood forest, nesting variously under rocks beneath cow dung, and in open soil with multiple small crater nests. He found seed chambers in some nests and observed workers feeding on a dead beetle. A winged queen has been collected on 1 July. In Nevada, G. C. and Jeanette N. Wheeler (1986g) found a single colony under a half-buried stone in yucca-larrea desert.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. COLORADO: Colorado Springs (W. M. Wheeler). Scale bars = 1 mm.



Pheidole ceres Wheeler

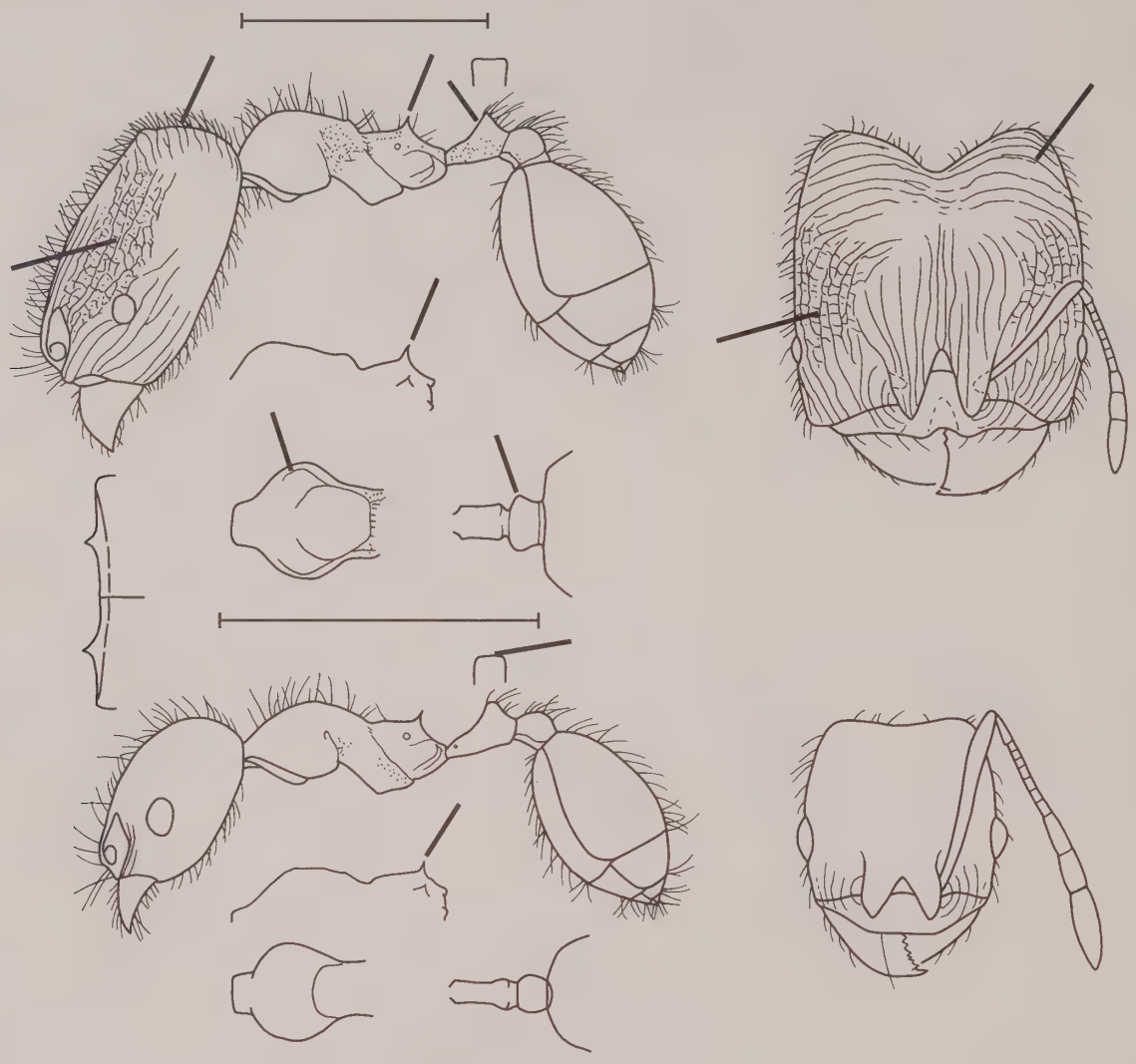
Pheidole ceres Wheeler 1904a: 10. Syn.: *Pheidole ceres* subsp. *tepaneca* Wheeler 1914c: 46, n. syn.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *Ceres,* the pre-Roman goddess of agriculture, evidently in reference to the seed-harvesting practiced by the species.
DIAGNOSIS A member of the "*bicarinata* complex" of the larger *pilifera* group, comprising *agricola, aurea, barbata, bicarinata, centeotl, cerebrosior, ceres, defecta, gilvescens, macclendoni, macrops, marcidula, paiute, pinealis, psammophila, vinelandica, xerophila, yaqui,* and *yucatana,* which complex is characterized by the large to very large, forward-set eyes, especially in the minor; and in the major, the occipital lobes lacking any sculpturing (except in *aurea*); the posterior half of the head capsule almost entirely smooth and shiny; and the postpetiolar node seen from above oval, elliptical, or laterally angulate (cornulate in *cerebrosior*).
P. ceres is distinguished within the complex by the following combination of traits. Dark to blackish brown.
Major: carinulae originating on the frontal triangle travel along the midline to the occiput; transverse carinulae present along the anterior lateral margins of the pronotum; mesonotal convexity and propodeal spines well-developed; postpetiole from above laterally angulate and diamond-shaped.
Minor: eyes moderately large; mesonotal convexity low but well-developed.
MEASUREMENTS (mm) Lectotype major: HW 1.14, HL 1.18, SL 0.66, EL 0.16, PW 0.54.
Paralectotype minor: HW 0.54, HL 0.60, SL 0.54, EL 0.12, PW 0.34.
COLOR Major: body blackish brown, with brownish yellow clypeus; appendages brownish yellow to medium brown.
Minor: like the major, except that the clypeus is not yellow but dark brown and hence not contrasting.
RANGE Foothills of the Rockies in eastern Colorado at 1800–2600 m, southwest to the mountains of New Mexico and Arizona, at 2200–2700 m, as well as extreme eastern Nevada. Also recorded from the Davis Mts. of Texas but evidently rare there (Creighton 1950a: 174), and from Guerrereo Mills, in the mountains of Hidalgo (*tepaneca* types).
BIOLOGY According to Stefan Cover, *ceres* is found at higher elevations and in colder climates than any other *Pheidole* species in the western North American fauna. In southern Arizona it is often the only *Pheidole* occurring above 2250 m. Gregg (1963) reports

ceres to be the most abundant *Pheidole* in Colorado, where it occurs in a wide array of habitats, including ponderosa pine forest, foothills meadowland, and sagebrush. Cover found the species in the same general habitats in Arizona and New Mexico. In Nevada G. C. and J. Wheeler (1986g) found a colony at 2650 m in juniper-pinyon woodland. The ants collect and store seeds of a variety of grasses and herbaceous angiosperms. *P. ceres* nests in several types of open soil under rocks. Colonies are large and active, consisting of up to 1000 ants. Majors are numerous and most colonies are monogynous. *P. ceres* is also notable as the host of the workerles parasite *P. elecebra*. Winged sexuals have been found in nests principally from early to the middle of July, with one record of males on 9 September. Winged reproductives have been found in nests throughout July, and a wingless queen was collected on 21 July, presumably following a nuptial flight.

Compare with *californica*

FIGURE Upper: paratype, major. Lower: paratype, minor. CALIFORNIA: Pyramid Head, San Clemente Island, San Diego County. Scale bars = 1 mm.

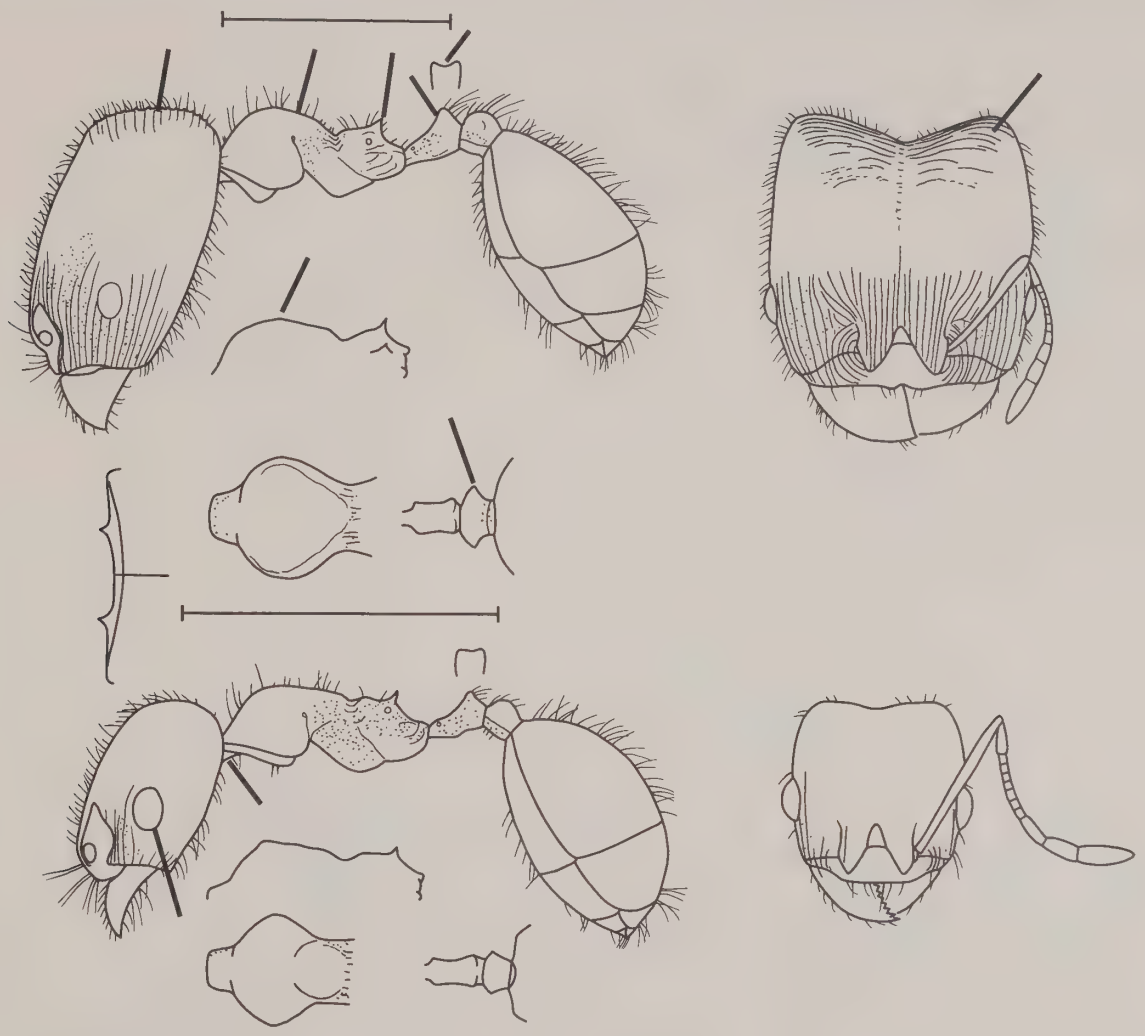


Pheidole clementensis Gregg

Pheidole clementensis Gregg 1969b: 93.

TYPES Natural History Museum of Los Angeles County; Mus. Comp. Zool. Harvard; Amer. Mus. Nat. Hist.
ETYMOLOGY Referring to the type locality.
DIAGNOSIS A member of the "*pilifera* complex" of the larger *pilifera* group; for a characterization of the complex, see under *pilifera*. *P. clementensis* is distinguished within the complex by the following combination of traits.
Major: side of head densely rugoreticulate; occiput extensively rugulose; pronotum smooth and shiny, propodeal spine moderately large, acute; postpetiole from above trapezoidal; humerus in dorsal-oblique view low and smooth and shiny.
Closest to *californica,* from which it differs by its larger size (HW in *clementensis* about 1.1 mm, in *californica* major about 0.90 mm) and proportionately smaller eye (major EL/HW 0.13 in *clementensis* versus 0.20 in *californica*).
MEASUREMENTS (mm) Paratype major: HW 1.08, HL 1.18, SL 0.54, EL 0.14, PW 0.54.
Paratype minor: HW 0.54, HL 0.56, SL 0.52, EL 0.12, PW 0.30.
COLOR Major: head dark yellow, with at least occasionally a pair of medium brown spots on vertex, falling on either side of the cephalic midline; rest of body light yellowish brown.
Minor: body concolorous dark brown, appendages yellow.
RANGE San Clemente Island and parts of mainland California (Philip S. Ward, personal communication).
BIOLOGY Roy Snelling (in Gregg 1969b) reports that *P. clementensis* is one of the commonest ants on San Clemente Island (especially on the seaward side), where it nests under stones. The minor workers are nocturnal, starting to forage shortly before sundown. They are evidently mostly or entirely granivorous, preferring the seeds of *Cassus cretica* but also gathering grass seeds and those of a small legume, probably a species of *Lotus*. The majors form an unusually high percentage of the worker population.

FIGURE Upper: paratype, major. Lower: paratype, minor. OREGON: Applegate, Jackson Co. Scale bars = 1 mm.

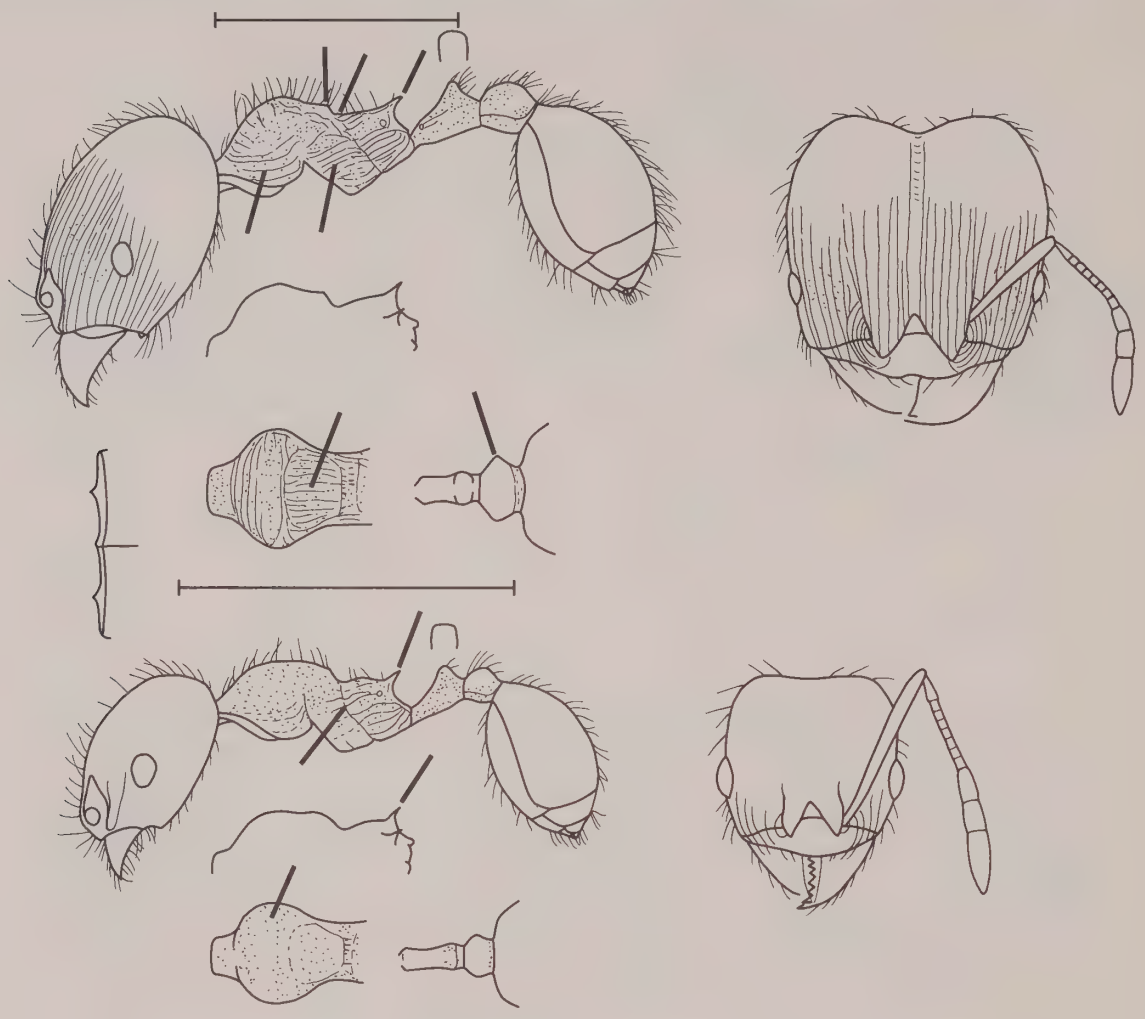


Pheidole creightoni Gregg

Pheidole creightoni Gregg 1955a: 19.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the pioneering American myrmecologist William S. Creighton.
DIAGNOSIS A member of the "*pilifera* complex" of the larger *pilifera* group; for a characterization of the complex, see under *pilifera*. *P. creightoni* is distinguished within the complex by the following combination of traits.
Major: occiput in side view very broad, as much as 1.5× the anterior cephalic capsule border; promesonotum forms a smooth, single convexity; petiolar node tapering to a blunt point in side view and with a deeply concave border seen from behind; postpetiole from above spinose.
Minor: yellowish brown; eye very large; humerus subangulate in dorsal-oblique view; petiolar node tapers to a blunt point in side view; postpetiole seen from above trapezoidal.
MEASUREMENTS (mm) Paratype major: HW 1.22, HL 1.32, SL 0.58, EL 0.16, PW 0.48.
Paratype minor: HW 0.54, HL 0.60, SL 0.52, EL 0.14, PW 0.32.
COLOR Major: most of body and head, as well as mandibles, light reddish yellow; gaster plain light brown; legs clear dark yellow.
Minor: body light yellowish brown, appendages clear dark yellow.
RANGE Northern California to Oregon and Nevada.
BIOLOGY William S. Creighton (in Gregg 1955a) found 18 earthen nests of *creightoni* at the type locality, frequently near nests of the much larger ant *Messor (= Veromessor) andrei*. The entrances were surrounded by large rings of chaff, indicating that seeds are an important part of the diet. Tissue of freshly killed ground squirrels was also accepted by the majors and minors, which foraged in files. Soil nests have also been recorded on museum labels, in California by Diane W. Davidson and in Nevada by Philip S. Ward. Nuptial flights were recorded in August and September by Davidson and by Creighton respectively; they occurred about an hour before sunset.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. NEW JERSEY: Lakehurst. Scale bars = 1 mm.

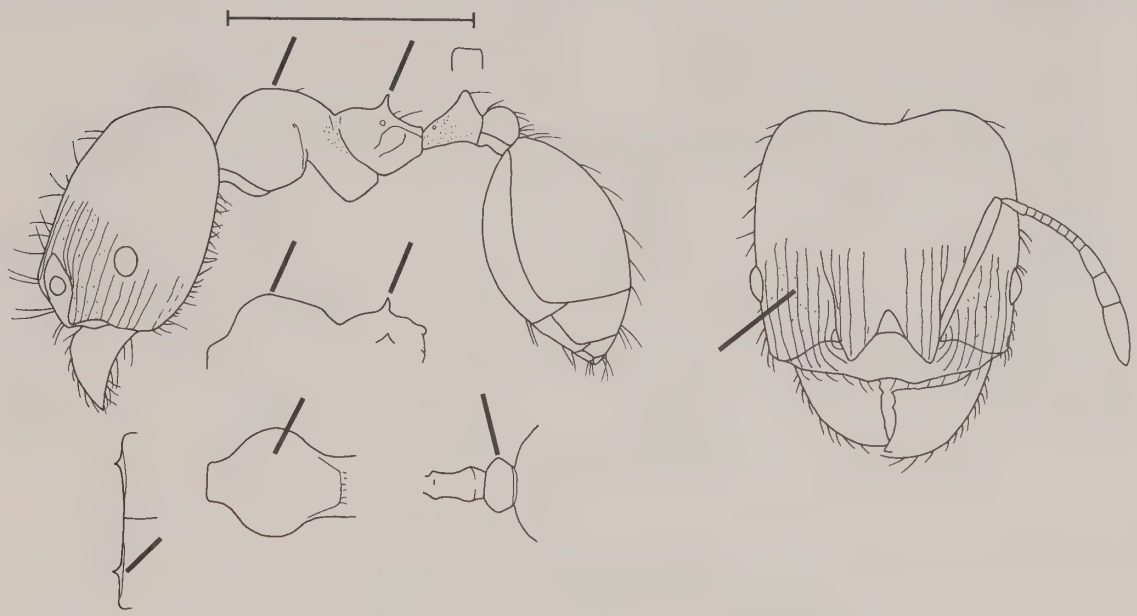


Pheidole davisi Wheeler

Pheidole davisi Wheeler 1905j: 380.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Eponymous.
DIAGNOSIS A small brown member of the *pilifera* group distinguished by the following traits.
Major: mesonotal convexity small, obtuse-subangular; metanotal groove absent, with metanotal profile forming a continuous line with that of the basal propodeal face; mesonotal dorsum, mesopleuron, and side of propodeum covered with longitudinal carinulae, foveolate, and opaque; pronotal dorsum transversely and pronotal sides longitudinally carinulate, foveolate, and opaque.
Minor: mesopleuron and side of propodeum longitudinally carinulate; all of mesosoma foveolate and opaque.
Close to *adrianoi* of Florida but differing in the above and other characters.
MEASUREMENTS (mm) Paratype major: HW 0.98, HL 0.96, SL 0.44, EL 0.12, PW 0.46.
Paratype minor: HW 0.44, HL 0.46, SL 0.42, EL 0.08, PW 0.30.
COLOR Major: body light reddish to yellowish brown.
Minor: body concolorous dark reddish brown; antennae yellowish brown.
RANGE In the United States, *davisi* has been recorded from New York to North Carolina and northern Alabama. I have also identified a series collected by Stuart and Jarmila Kukalová-Peck from the Mesa de Chipinque Monterrey, Nuevo Leon, in northeastern Mexico. The species thus appears to have a disjunct distribution between the southeastern U.S. and northeastern Mexico, of the kind known in many other animal and plant species.
BIOLOGY In the eastern United States, *davisi* is typically an inhabitant of pine barrens, where it has been found in crater nests constructed in open sandy areas exposed to the sun. Its habitat in Mexico is unknown. Colonies have been observed to harvest seeds (Stefan Cover).

FIGURE Unique holotype, major. GUATEMALA (no further locality). Scale bar = 1 mm.

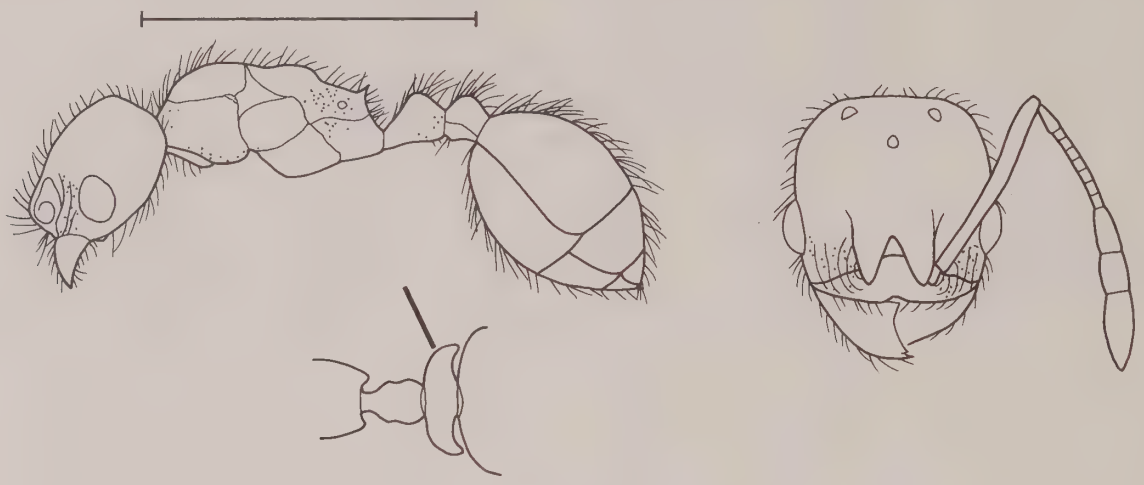


Pheidole defecta Santschi

Pheidole defecta Santschi 1923d: 54. Redescribed by B. Hölldobler and E. O. Wilson 1992: 16.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY L *defecta,* fault, lack (significance unknown).
DIAGNOSIS A unique but problematic species known only from the holotype **major**, tentatively placed in the *pilifera* group because of the 2-toothed hypostoma but equally well placed in the *flavens* group because of the overall habitus; the discovery of the minor may help settle the matter. Close in habitus to *nasutoides* (which is placed in the *flavens* group), but differing in promesonotal shape, smaller size of the propodeal spine and spiracle, mostly smooth and shiny body, much sparser pilosity, and different color.
MEASUREMENTS (mm) Holotype major: HW 1.10, HL 1.10, SL 0.64, EL 0.16, PW 0.56.
COLOR Major: concolorous medium yellow.
RANGE Known only from the holotype major.
BIOLOGY Unknown.

FIGURE Queen. COLORADO: 2.2 km north of North Cheyenne, Colorado Springs, 2200 m (Stefan Cover), compared with syntype. (Type Locality: Manitou, Colorado, 2130 m, W. M. Wheeler.) Scale bar = 1 mm.

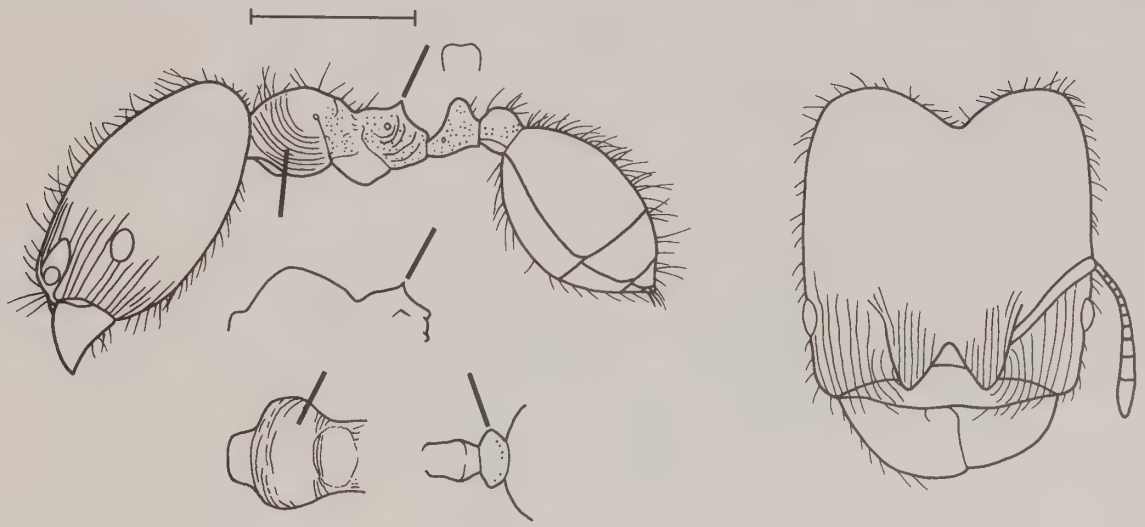


Pheidole elecebra (Wheeler)

Sympheidole elecebra Wheeler 1904a: 8. Combination in *Pheidole* by D. R. Smith 1979.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *elecebra,* freeloaders, a social parasite.
DIAGNOSIS A very small member of the *pilifera* group, a permanent, workerless social parasite of *Pheidole ceres,* distinguishable at once by the enormous curved, hornlike lateral extensions of the postpetiolar node; otherwise overall normal in appearance for a *Pheidole* queen.
MEASUREMENTS (mm) Syntype queen: HW 0.58, HL 0.60, EL 0.22 (SL and PW not measured).
COLOR Queen: light brown.
RANGE Known from several records in Colorado between 2000 and 2200 m; the preferred habitat is the same as that of its host, that is, primarily pinyon-cedar-oak woodland (Gregg 1963).
BIOLOGY Wheeler (1904a, 1910b), from an examination of a living host colony and its *elecebra* guests, concluded that the inquiline behaves like *Anergates atratulus* of Europe in preventing the host colony from producing new reproductives (queens and males) of its own. Contrary evidence was obtained by Stefan Cover, who rediscovered the species in 1994. One mixed colony he collected near North Cheyenne, Colorado, contained a dealate *elecebra* queen, many winged *elecebra* queens, and queen pupae of the parasite, but also abundant host *(ceres)* minor and major brood, along with 400–600 adult host minors and majors; this combination constitutes virtual proof that a reproducing host queen was also present. A second colony contained beyond 200–300 adult host minors and majors, only adult parasite males and parasite male pupae. This combination suggests the absence of a host queen.

FIGURE Lectotype, major. ARIZONA: Tucson (W. M. Wheeler). Scale bar = 1 mm.



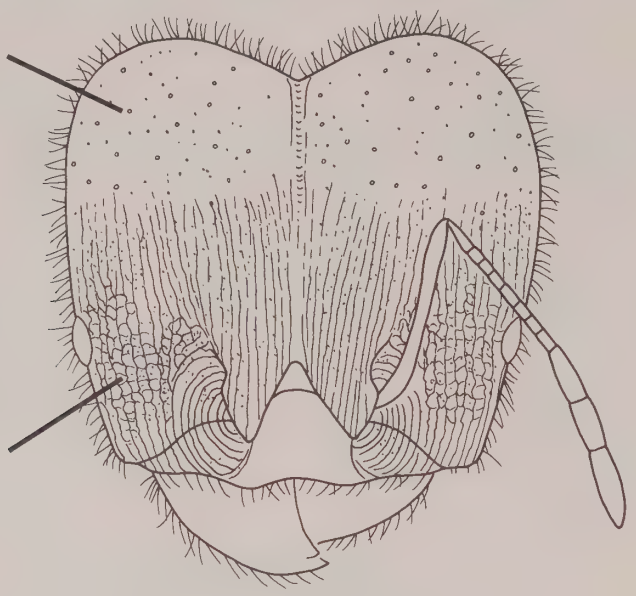
Pheidole gilvescens Creighton and Gregg

Pheidole gilvescens Creighton and Gregg 1955: 5. First available use of *Pheidole xerophila* subsp. *tucsonica* var. *gilvescens* Wheeler 1908h: 448, unavailable name (quadrinomial).

TYPES Mus. Comp. Zool. Harvard; Amer. Mus. Nat. Hist.
ETYMOLOGY L *gilvescens,* pale yellow, pertaining to the color of the minor, distinguishing the species from *xerophila.*
DIAGNOSIS A small, large-eyed member of the *pilifera* group, close to *xerophila* and distinguished from it as follows.
Major: body almost entirely reddish yellow; postpetiolar node transversely oval in shape; sides of pronotum carinulate.
Minor: entirely yellow (as opposed to yellowish brown).
With *xerophila,* the entire head of the **major** tapers conspicuously from midlevel to the occiput in side view.
MEASUREMENTS (mm) Lectotype major: HW 1.42, HL 1.48, SL 0.66, EL 0.22, PW 0.66.
Paralectotype minor: HW 0.58, HL 0.80, SL 0.52, EL 0.18, PW 0.32.
COLOR Major: body and appendages dark reddish yellow; gaster partly light brown.
Minor: body medium yellow, appendages pale yellow.
RANGE Creighton and Gregg (1955) and Wheeler and Wheeler (1986g) report the species (and I have mostly confirmed) as occurring from south-central Arizona through southern Nevada to the eastern slope of the California Sierras.
BIOLOGY In southern California, Snelling and George (1979) found *gilvescens* common at 150–1500 m in grassland, creosote bush scrub, wash woodlands, and joshua tree woodlands. Small crater nests are built in sand and are often surrounded by chaff. The colonies contain up to 500 workers. The ants are primarily granivorous but also collect arthropods, apparently as scavengers. Repletes are occasionally found. Foraging begins at dusk, continues through the night, and ends early in the morning. Winged queens have been found in nests in late May, and males in May and September.

Compare with *obtusospinosa*

FIGURE Supermajor, head. MEXICO: km 275, Highway 150 northeast of Chapulco, Puebla.

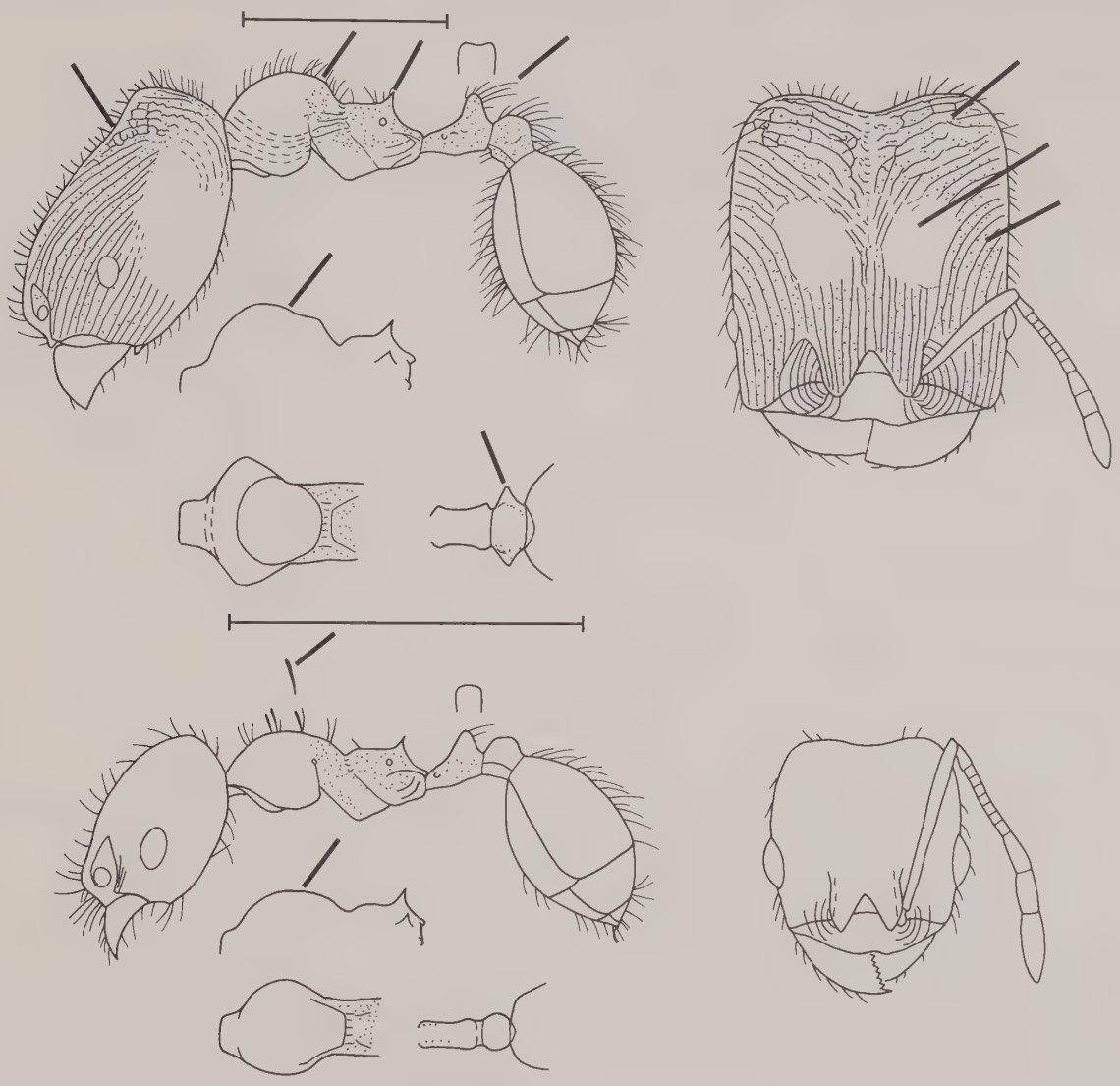


Pheidole hirtula Forel

Pheidole vaslitii var. *hirtula* Forel 1899e: 65. Raised to species level by Creighton 1950a: 211. Syn.: *Pheidole (Cardiopheidole) vaslitii* var. *acolhua* Wheeler 1914c: 48; synonymy by Creighton 1958: 211.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY L *hirtula,* little hairy one.
DIAGNOSIS A large trimorphic species (major, supermajor, minor) placed in the *pilifera* group because of the 2-toothed hypostoma but with other traits conforming to the *fallax* group. Very close to *obtusospinosa,* distinguished most readily in the **supermajor**, as illustrated, by the rounded foveae of the rear half of the dorsum of the head, with the interspaces smooth and shiny. This form is considered by Ward (1999) to be a likely geographic subspecies of *obtusopilosa* rather than a full species.
MEASUREMENTS (mm) All from near Chapulco, Puebla.
Supermajor: HW 2.60, HL 2.40, SL 1.18, EL 0.32, PW 1.34.
Major: HW 1.52, HL 1.60, SL 1.10, EL 0.24, PW 0.82.
Minor: HW 0.66, HL 0.86, SL 1.04, EL 0.20, PW 0.48.
COLOR Supermajor, major, and minor: head and appendages light reddish brown to plain medium brown, rest of body medium brown.
RANGE According to Creighton (1958), who studied *hirtula* closely, the species occurs between 1070 and 2310 m, with most colonies concentrated at 1500–2100 m, from northern Chihuahua southward through Coahuila, Nuevo León, San Luis Potosí and Zacatecas to Hidalgo, Querétaro, and Jalisco. Barry E. Pullen (personal communication) reports the species as common in the suburbs of Mexico City.
BIOLOGY Creighton (1958) reports that mature colonies are very large, with numerous majors, and occasionally dominate the immediate surrounding area to the exclusion of other ant species. Winged reproductives are found in the nests from April to at least September, and nuptial flights evidently occur in late August into early September. According to Barry Pullen, the size variation of the workers is continuous, but with sharp modes marking the minor, major, and supermajor castes.

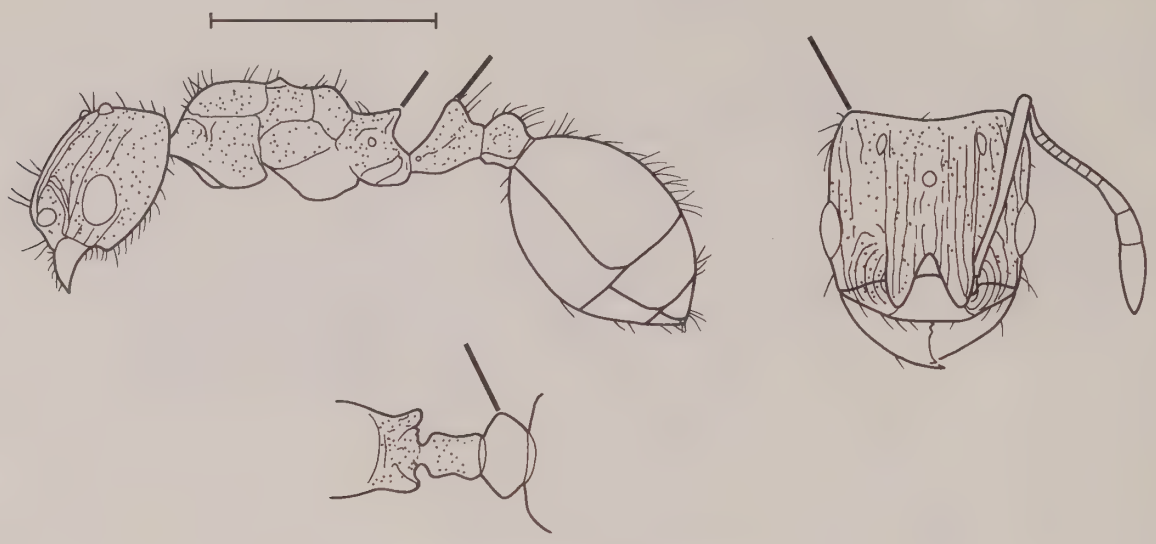
FIGURE Upper: holotype, major. Lower: paratype, minor. TEXAS: Starr County (W. Cloyd). Scale bars = 1 mm.



Pheidole hoplitica **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *hoplitica,* referring to the hoplite, a heavily armed soldier of ancient Greece.
DIAGNOSIS A member of the "*pilifera* complex" of the larger *pilifera* group, comprising *calens, californica, carrolli, cavigenis, clementensis, creightoni, hoplitica, littoralis, micula, pilifera, rugulosa, senex, soritis, tepicana,* and *torosa,* which complex is characterized by the following traits. Major: dorsal head surface extensively sculptured; occipital lobes horizontally rugulose (or, in *carrolli* smooth, in *littoralis* foveate, and in *micula* and *soritis* carinulate); postpetiole from above diamond-shaped, trapezoidal, or spinose. Minor: eye medium-sized to large.
P. hoplitica is distinguished within the complex, including *cavigenis,* which it most resembles, by the following combination of traits.
Major: posterior dorsal profile of head markedly concave; occiput partly rugoreticulate; carinulae that originate from around frontal triangle turn outward near the center of the head toward the occipital corners; promesonotum strongly convex, almost semicircular in profile; postpetiolar node in side view wide and broadly rounded, not narrow and abruptly rounded.
Minor: head and sides of pronotum smooth and shining, not densely sculptured and opaque; some of the hairs of the promesonotal dorsal surface clavate.
MEASUREMENTS (mm) Holotype major: HW 1.24, HL 1.52, SL 0.60, EL 0.22, PW 0.70.
Paratype minor: HW 0.50, HL 0.56, SL 0.46, EL 0.14, PW 0.32.
COLOR Major: light reddish brown.
Minor: brownish yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Syntype, queen. COLORADO: Broadmoor, Colorado Springs, 2000 m (William M. Wheeler). (Majors and minors have been discovered but are not figured; see under Biology below.) Scale bar = 1 mm.

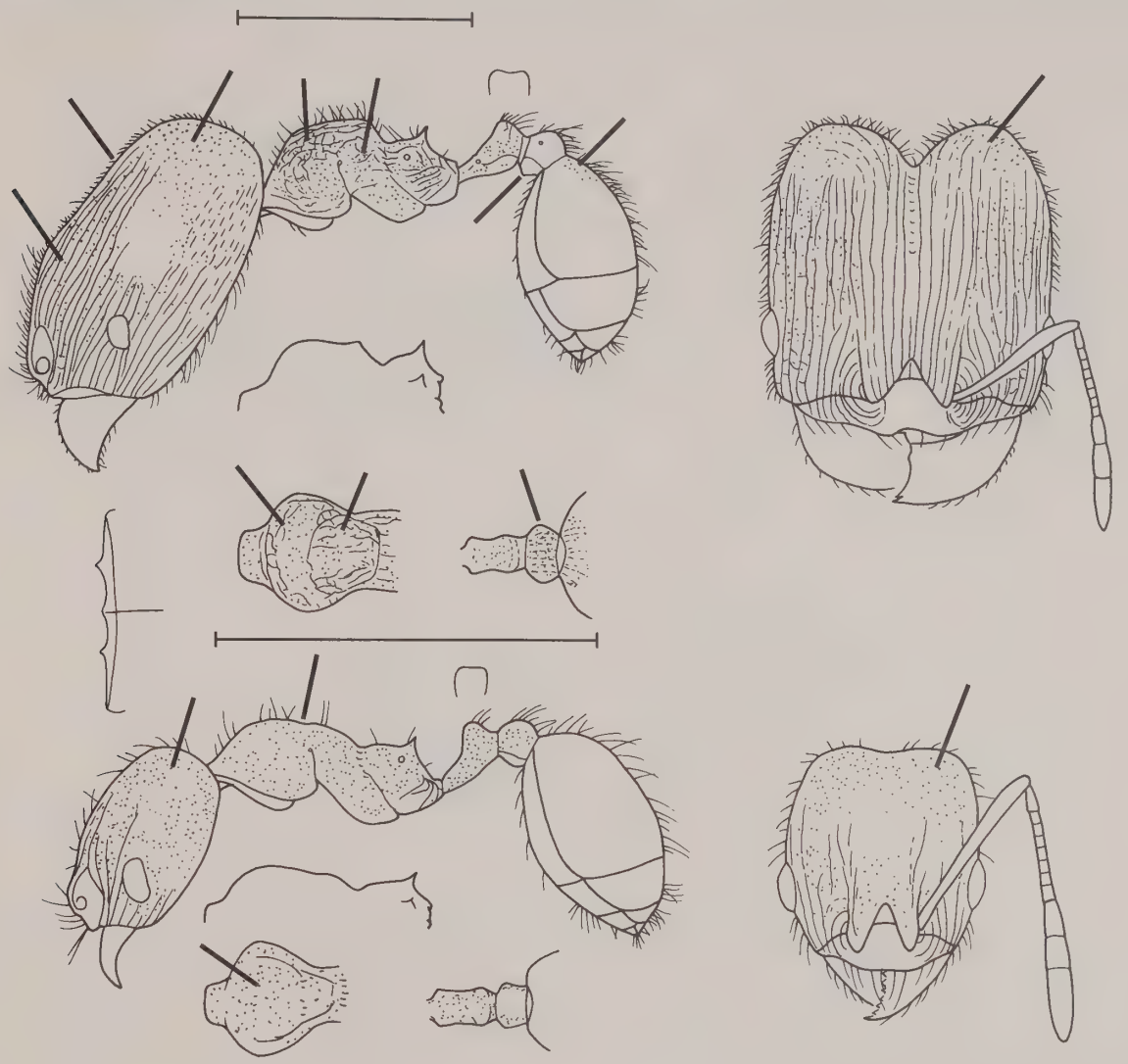


Pheidole inquilina (Wheeler)

Epipheidole inquilina Wheeler 1903h: 664. Combination in *Pheidole* by Cole 1965: 174.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *inquilina,* temporary guest, lodger.
DIAGNOSIS A permanent social parasite of *Pheidole pilifera* (including "subspecies *coloradensis*"). The queen is very small, and easily recognized by her subangulate occipital corners. Aside from these two traits, and possibly the rounded tips of the propodeal spines, *inquilina* queens are little modified in general from typical queens of other, non-parasitic species of *Pheidole*.
MEASUREMENTS (mm) Syntype queen: HW 0.70, HL 0.70, SL 0.64, EL 0.24, PW (not measured).
COLOR Queen: light brown.
RANGE Colorado, Nebraska, and Nevada: rare (Wheeler 1910b; M. R. Smith 1940a; Gregg 1963; D. R. Smith 1979). In Colorado, *inquilina* occurs at about 2000 m.
BIOLOGY In Colorado *Pheidole inquilina* was found by Wheeler with the host species *P. pilifera* ("subspecies *coloradensis*") at about 2000 m, under rocks most likely in pinyon-cedar-oak woodland. The species is the least anatomically modified of the pheidoline social parasites. It is therefore not very surprising that both the major and minor workers have been discovered in addition to the usual queens and males. However, these castes are evidently in a state of evolutionary decline. In 19 infested nests of the host species excavated by A. C. Cole (1965), 8 contained a few individuals of *inquilina*; and of these, one nest yielded only a single minor worker of *inquilina,* while another contained one minor and one major. M. R. Smith (1940a) noted the close resemblance of the worker castes between the two species, and suggested that *inquilina* was derived in evolution from *pilifera* or a related species. In other words, Emery's rule that social parasites are close relatives of their hosts is exemplified.

FIGURE Upper: paratype, major. Lower: paratype, minor. FLORIDA: Lido Beach, Sarasota. Scale bars = 1 mm.



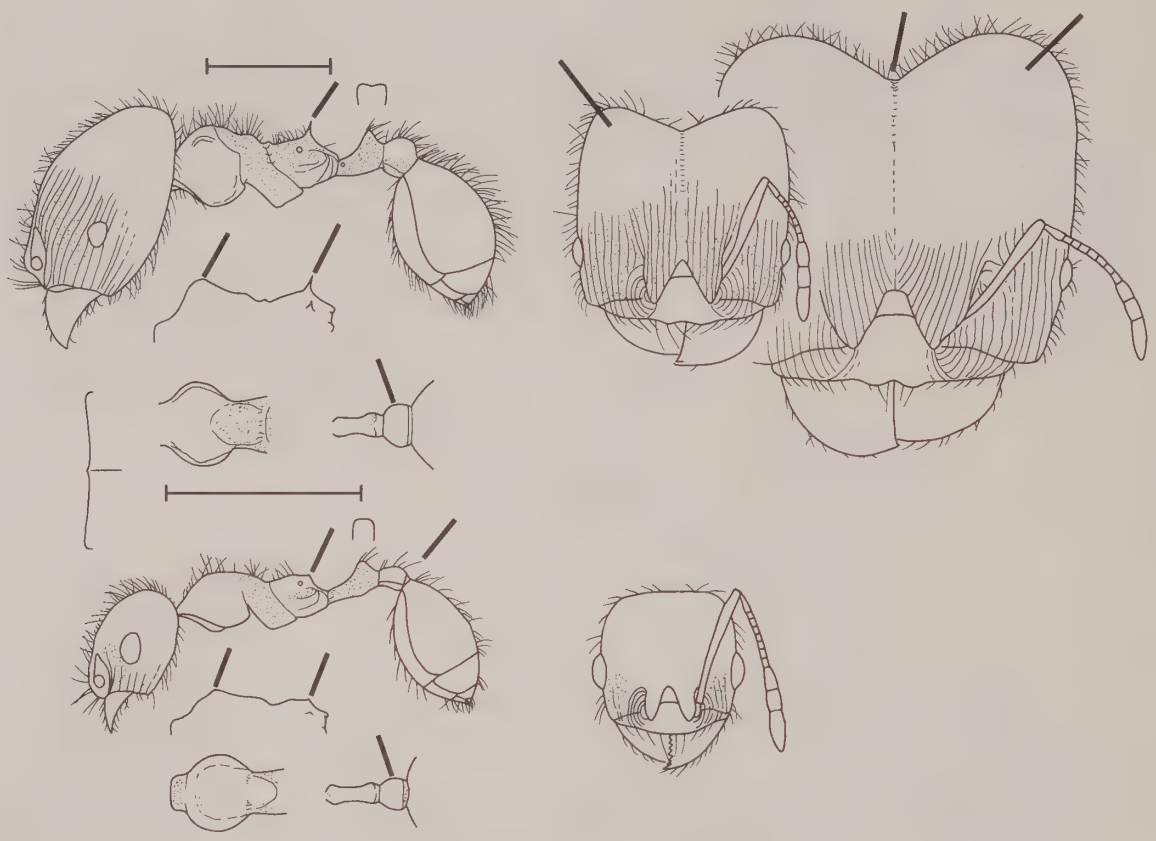
Pheidole littoralis Cole

Pheidole sitarches littoralis Cole 1952b: 443. Raised to species level by Naves 1985: 64.

TYPES Amer. Mus. Nat. Hist.; Nat. Mus. Nat. Hist. U.S.; Mus. Comp. Zool. Harvard.
ETYMOLOGY L *littoralis,* of the shore, referring to the habitat at the type locality.
DIAGNOSIS A member of the "*pilifera* complex" of the larger *pilifera* group, comprising *calens, californica, carrolli, cavigenis, clementensis, creightoni, hoplitica, littoralis, micula, pilifera, polymorpha, rugulosa, senex, soritis, tepicana, torosa,* which complex is characterized by the following traits. Major: dorsal head surface extensively sculptured; occipital lobes horizontally rugulose (or, in *carrolli* smooth, in *littoralis* foveate, and in *micula* and *soritis* carinulate; postpetiole from above diamond-shaped, trapezoidal, or spinose. Minor: eye medium-sized to large.
P. littoralis is easily distinguished within the complex by the following combination of traits.
Major: occiput not rugulose, but covered with conspicuous foveae; anterior and lateral margins of pronotum rugoreticulate; mesonotum longitudinally carinulate; triangular subpostpetiolar process present; postpetiole from above diamond-shaped.
Minor: most of head, mesosoma, and waist foveolate and opaque.
MEASUREMENTS (mm) Paratype major: HW 1.40, HL 1.52, SL 0.56, EL 0.20, PW 0.58.
Paratype minor: HW 0.58, HL 0.50, SL 0.42, EL 0.12, PW 0.28.
COLOR Major: gaster plain medium to dark brown; remainder of body, and appendages, reddish brown.
Minor: most of body light brown, with dark brown gaster and brownish yellow appendages.
RANGE Apparently limited to central Florida.
BIOLOGY Naves (1985) and Stefan Cover (unpublished) found *littoralis* very common nesting in white-sand scrub at the Archbold Field Station near Lake Placid, Florida, and close to colonies of *adrianoi* and *metallescens*. The excavations are relatively very deep, beneath crescentic crater mounds, and the colonies small. A granary chamber filled with seeds is always found 10 to 20 cm beneath the surface.

Compare with species listed
in the Diagnosis below

FIGURE Upper: lectotype, major (body and full head), Corsicana, in Navarro Co. near Dallas, Texas. Paralectotype, supermajor (partial head only), Benson, Cochise Co., Arizona. Lower: paralectotype, minor, Laredo, Webb Co., Texas. Scale bars = 1 mm.



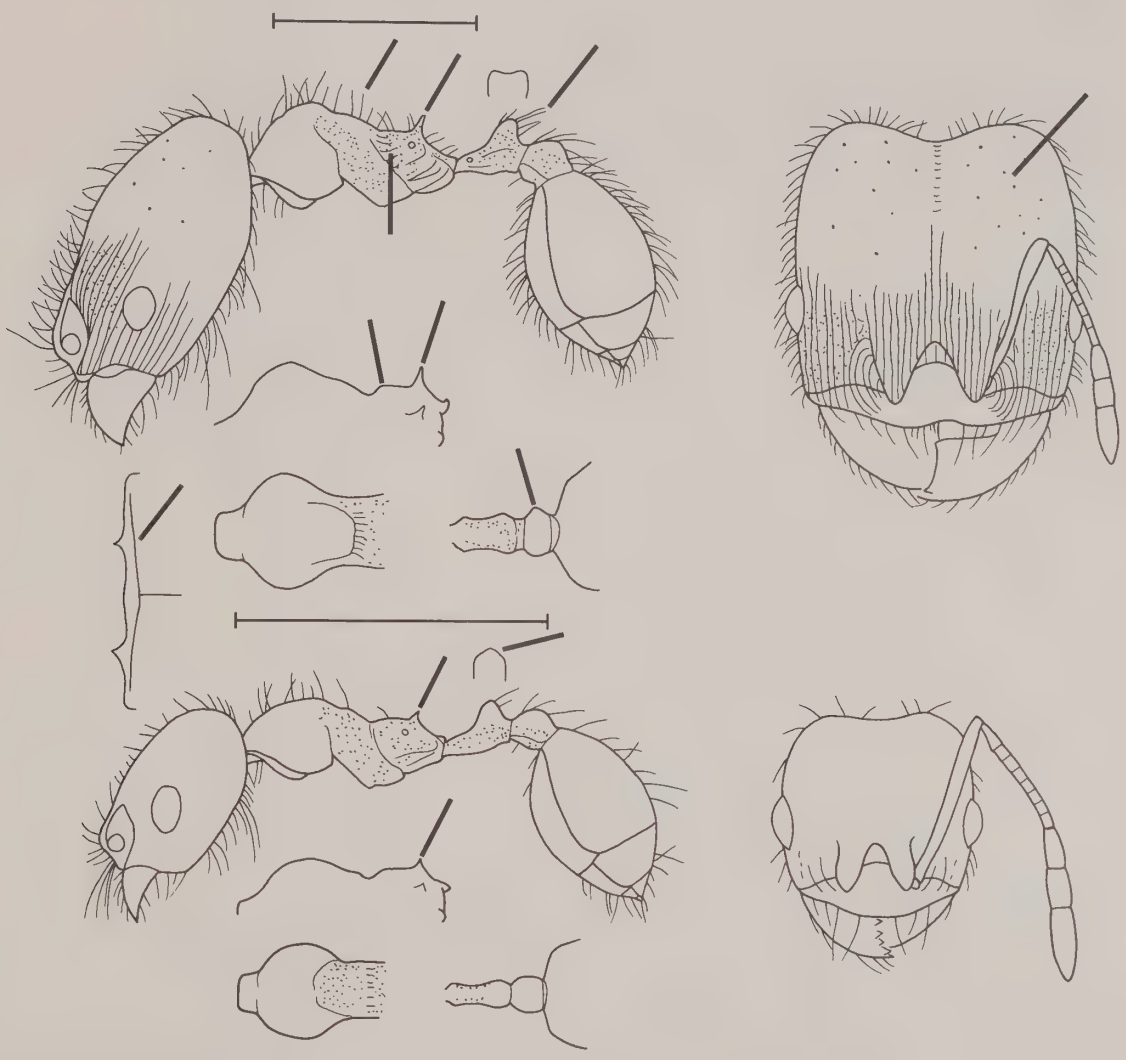
Pheidole macclendoni Wheeler

Pheidole macclendoni Wheeler 1908h: 450.

TYPES Amer. Mus. Nat. Hist.; Mus. Comp. Zool. Harvard.
ETYMOLOGY Eponymous.
DIAGNOSIS A member of the "*bicarinata* complex" of the larger *pilifera* group, comprising *agricola, aurea, barbata, bicarinata, centeotl, cerebrosior, defecta, gilvescens, macclendoni, macrops, marcidula, micula, paiute, pinealis, vinelandica, xerophila, yaqui,* and *yucatana,* which complex is characterized by the large to very large, forward-set eyes of both castes, especially the minor; and, in the major, the occipital lobes lacking any sculpturing (except in *aurea*); the posterior half of the head capsule almost entirely smooth and shiny; and the postpetiolar node seen from above oval, elliptical, or laterally angulate (cornulate in *cerebrosior*).
P. macclendoni is distinguished by the presence of a supermajor in addition to the major caste and is further distinguished by the following traits.
Major: long, thin propodeal spine; prominent humeral lobe in dorsal-oblique view; bell-shaped postpetiolar node seen from above.
Supermajor: lacks sculpturing on the posterior half of the head.
Minor: propodeal spines reduced to denticles; humerus subangulate in dorsal-oblique view; very low postpetiolar node in side view; bell-shaped postpetiolar node seen from above.
MEASUREMENTS (mm) Lectotype major: HW 1.50, HL 1.60, SL 0.82, EL 0.26, PW 0.74.
Paralectotype supermajor: HW 2.74, HL 2.58, SL 1.02, EL 0.34,. PW (not measured).
Paralectotype minor: HW 0.62, HL 0.64, SL 0.60, EL 0.18, PW 0.38.
COLOR Major: reddish yellow, gaster a slightly contrasting yellowish brown.
Supermajor: concolorous reddish yellow.
Minor: body light brown, appendages a lighter shade of yellowish brown.
RANGE Evidently scarce, recorded from Arizona, as well as central and western Texas.
BIOLOGY In western Texas Moody and Francke (1982) discovered two colonies nesting in open soil and one beneath a clump of grass. Winged queens were found by William S. Creighton at Dryden, Texas, on 29 December.

Compare with *yaqui,* and other species listed in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: 4 km south-southeast of Guerrero Negro, Baja California Sur (Philip S. Ward). Scale bars = 1 mm.



Pheidole macrops **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *macrops,* large-eyed.

DIAGNOSIS A member of the "*bicarinata* complex" of the larger *pilifera* group, comprising *agricola, aurea, barbata, bicarinata, centeotl, cerebrosior, defecta, gilvescens, macclendoni, macrops, marcidula, paiute, pinealis, vinelandica, xerophila, yaqui,* and *yucatana (macrops* is closet to *yaqui),* which complex is characterized by the large to very large, forward-set eyes of both castes; and, in the major, the occipital lobes usually lacking any sculpturing; the posterior half of the head capsule almost entirely smooth and shiny; and the postpetiolar node seen from above oval, elliptical, or laterally angular (cornulate in *cerebrosior*).

P. macrops is distinguished within the complex by the following combination of traits.

Major: reddish brown; sides of pronotum longitudinally carinulate; posterior half of dorsum of head sprinkled with sparse foveae; propodeum spines relatively long and thin; apex of petiolar node in side view evenly rounded; postpetiolar node from above oval.

Minor: dorsal margin of petiolar node seen from behind rises to a peak; propodeal spines vertical.

MEASUREMENTS (mm) Holotype major: HW 1.14, HL 1.30, SL 0.60, EL 0.22, PW 0.56.

Paratype minor: HW 0.52, HL 0.56, SL 0.46, EL 0.16, PW 0.30.

COLOR Major: concolorous medium reddish brown, tarsi yellow.

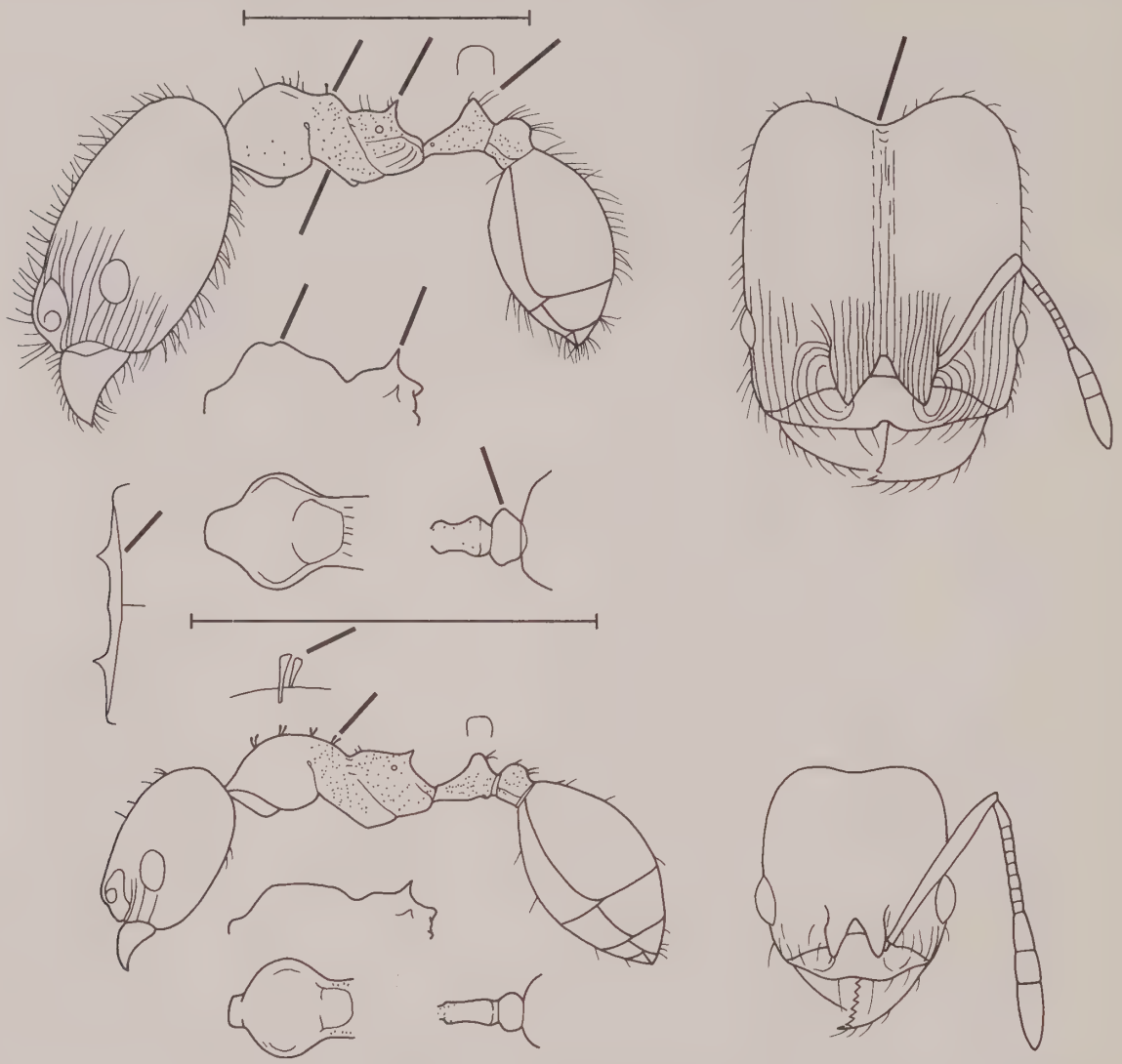
Minor: body and mandibles blackish brown to black, legs and antennae medium to dark brown.

RANGE Known only from the type locality.

BIOLOGY The type colony was collected from a ground nest in sandy desert (Philip S. Ward).

Compare with species listed
in the Diagnosis below

FIGURE Upper: major. TEXAS: 5 km south of Sierra Blanca, Hudspeth Co. (O. F. Francke and J. V. Moody). Lower: syntype, minor. TEXAS: Barton Creek, Austin (William M. Wheeler). (Type locality: Barton Creek, Texas.) Scale bars = 1 mm.

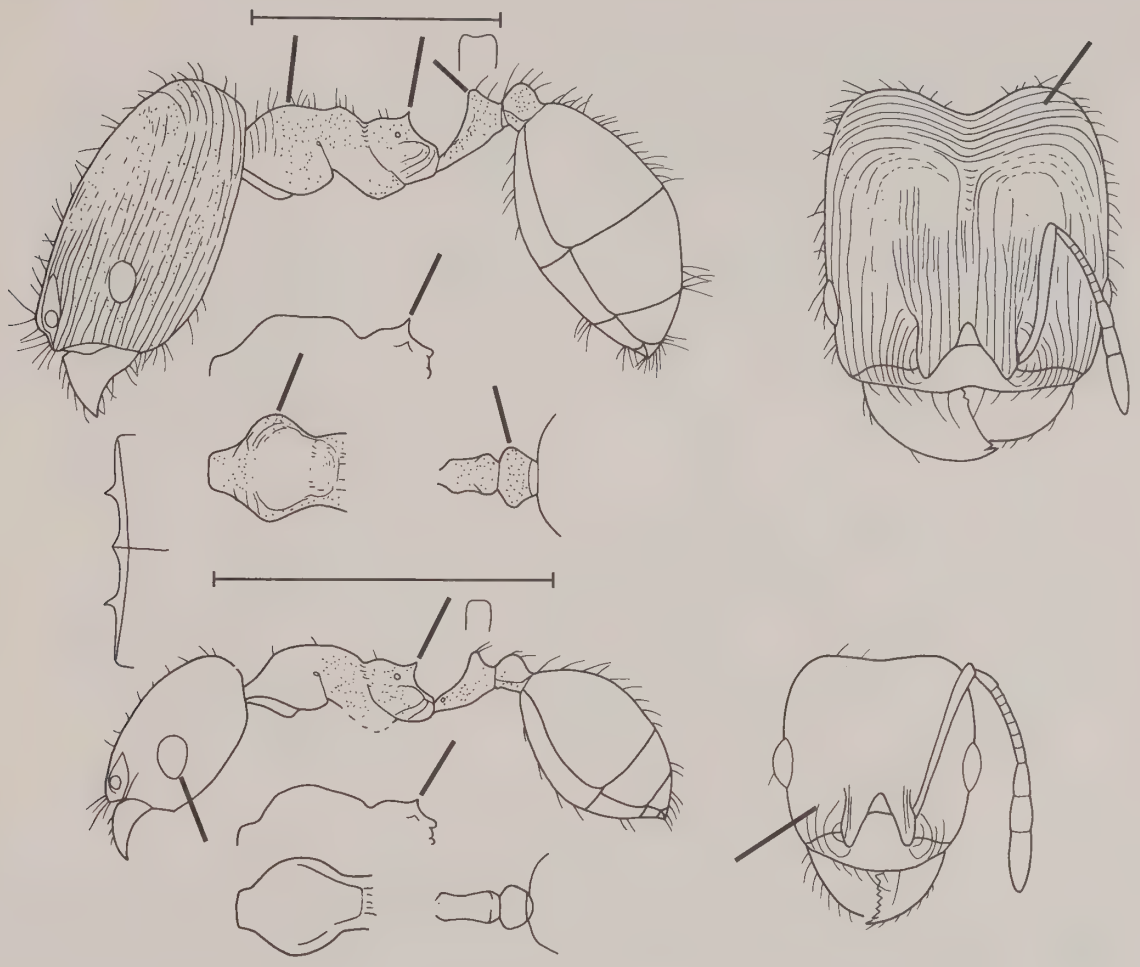


Pheidole marcidula Wheeler

Pheidole marcidula Wheeler 1908h: 457.

TYPES Amer. Mus. Nat. Hist; Mus. Comp. Zool. Harvard.
ETYMOLOGY L *marcidula,* little and weak, or wasted, allusion unknown.
DIAGNOSIS A member of the "*bicarinata* complex" of the larger *pilifera* group, comprising *agricola, aurea, barbata, bicarinata, centeotl, cerebrosior, defecta, gilvescens, macclendoni, macrops, marcidula, paiute, pinealis, vinelandica, xerophila, yaqui,* and *yucatana,* which complex is characterized by the large to very large, forward-set eyes in both castes; and, in the major, by the occipital lobes lacking any sculpturing (except in *aurea*); the posterior half of the head capsule almost entirely smooth and shiny; and the postpetiolar node seen from above oval, elliptical, or laterally angular (cornulate in *cerebrosior*).
P. marcidula is distinguished within the complex by the following combination of traits.
Major: clavate hairs occasional on mesosoma, with other ordinary pilosity sparse; apex of petiolar node in side view pointed; postpetiolar node from above laterally subangulate.
Minor: promesonotal dorsal profile lined with evenly spaced pairs of clavate hairs.
MEASUREMENTS (mm) Major (Sierra Blanca, Texas): HW 0.92, HL 1.22, SL 0.56, EL 0.16, PW 0.42.
Syntype minor: HW 0.44, HL 0.48, SL 0.42, EL 0.12, PW 0.28.
COLOR Major: overall yellow, with gaster and legs in lighter shade than rest of body.
Minor: concolorous pale yellow.
RANGE Known only from central and western Texas.
BIOLOGY *P. marcidula* is evidently a rare species. Wheeler (1908h) found one colony, nesting beneath a stone at Barton Creek, Texas. In Hudspeth County, Texas, Moody and Francke (1982) found a single colony at 1300 m, nesting in open sandy loam soil.

FIGURE Upper: syntype, major. Lower: syntype, minor. ARIZONA: Parmalee, Huachuca Mts. (William M. Wheeler). Scale bars = 1 mm.

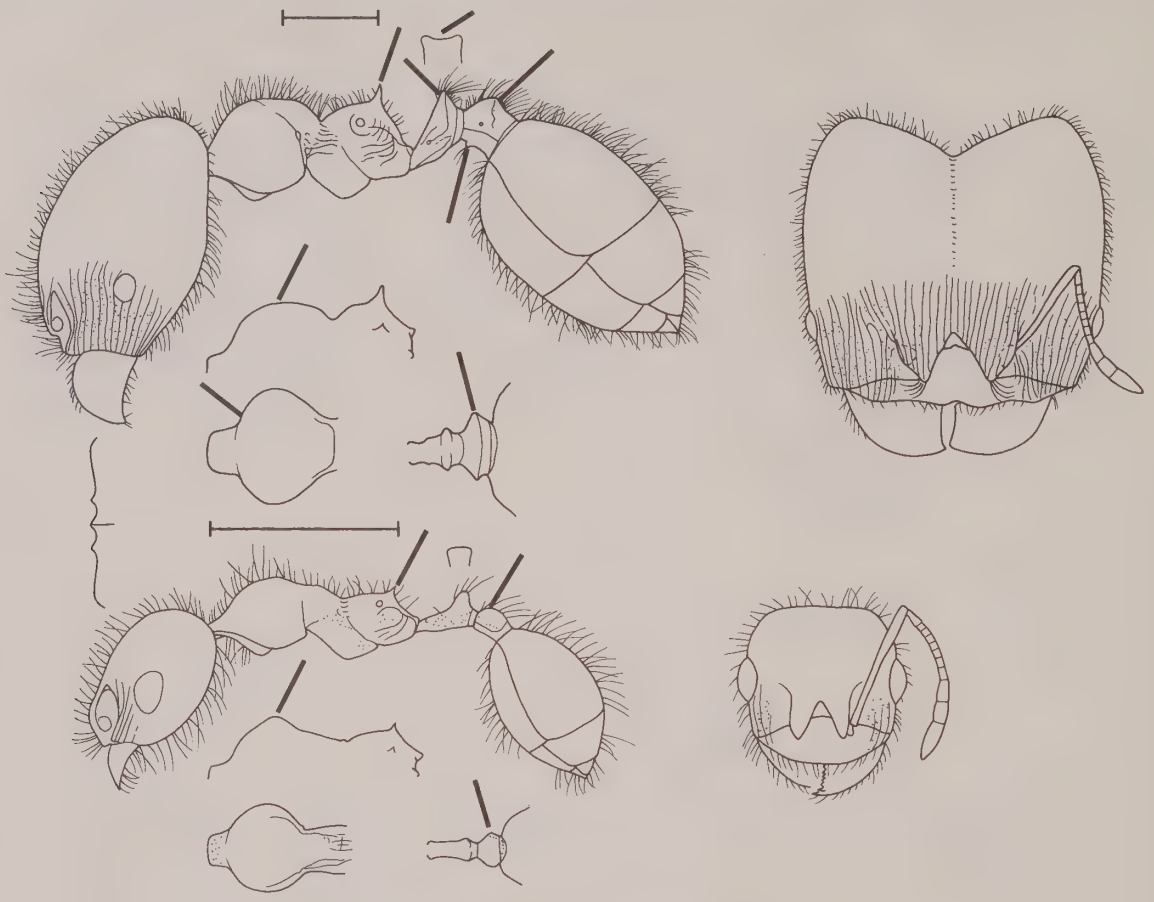


Pheidole micula Wheeler

Pheidole californica subsp. *micula* Wheeler 1915b: 408. Raised to species level by Gregg 1959: 24.

TYPES Mus. Comp. Zool. Harvard; Amer. Mus. Nat. Hist.
ETYMOLOGY L *micula,* small bit, crumb, or grain.
DIAGNOSIS A member of the "*pilifera* complex" of the larger *pilifera* group; for a characterization of the complex, see under *pilifera*. *P. micula* is distinguished within the complex by the following combination of traits.
Major: entire occiput covered by transverse carinulae that sometimes circle downward at the sides of the head and continue to the anterior border of the head; pronotum very low relative to the mesonotal convexity; propodeal spine equilaterally triangular; petiolar node from the side tapering to a blunt point; postpetiole from above diamond-shaped.
Minor: eye very large and set well forward on the head; propodeal spines reduced to denticles. Stefan Cover, who has studied this species more intensively, offers the following cautionary note *(in litt.)*: "The cephalic sculpture in *P. micula* majors is variable and may cause confusion. The type majors represent one extreme [as depicted here—EOW] in which the fine transverse rugae on the occiput wrap around the corners of the head and extend down the sides to the mandibular insertions. In most other collections these lateral rugae are partly absent, leaving the sides of the head posterior to the eye more or less smooth and shining, except for scattered punctures [foveolae]."
MEASUREMENTS (mm) Paratype major: HW 1.04, HL 1.18, SL 0.52, EL 0.16, PW 0.48.
Paratype minor: HW 0.48, HL 0.48, SL 0.44, EL 0.12, PW 0.30.
COLOR Major: clear yellow-orange, the head a shade darker than the rest of the body. Minor: concolorous clear yellow.
RANGE Southern California to western Texas.
BIOLOGY Stefan Cover (unpublished) encountered *micula* in the mountains of southern Arizona consistently between 1480 and 1690 m, in grassy meadows, sometimes surrounded by juniper-oak woodland. The small colonies were nesting variously under small rocks and in crater nest built in open soil. In western Texas, Moody and Francke (1982) found *micula* in crater nests built in open soil. A single colony was discovered by G. C. and J. N. Wheeler (1973c) in the cholla-palo verde scrub at Deep Canyon, California, nesting under a stone; seeds of *Artiplex, Cryptantha, Oenothera,* and *Sporobolus* were present in the nest.

FIGURE Upper: syntype, major. Lower: syntype, minor. ARIZONA: Hereford, Cochise Co. Scale bars = 1 mm.

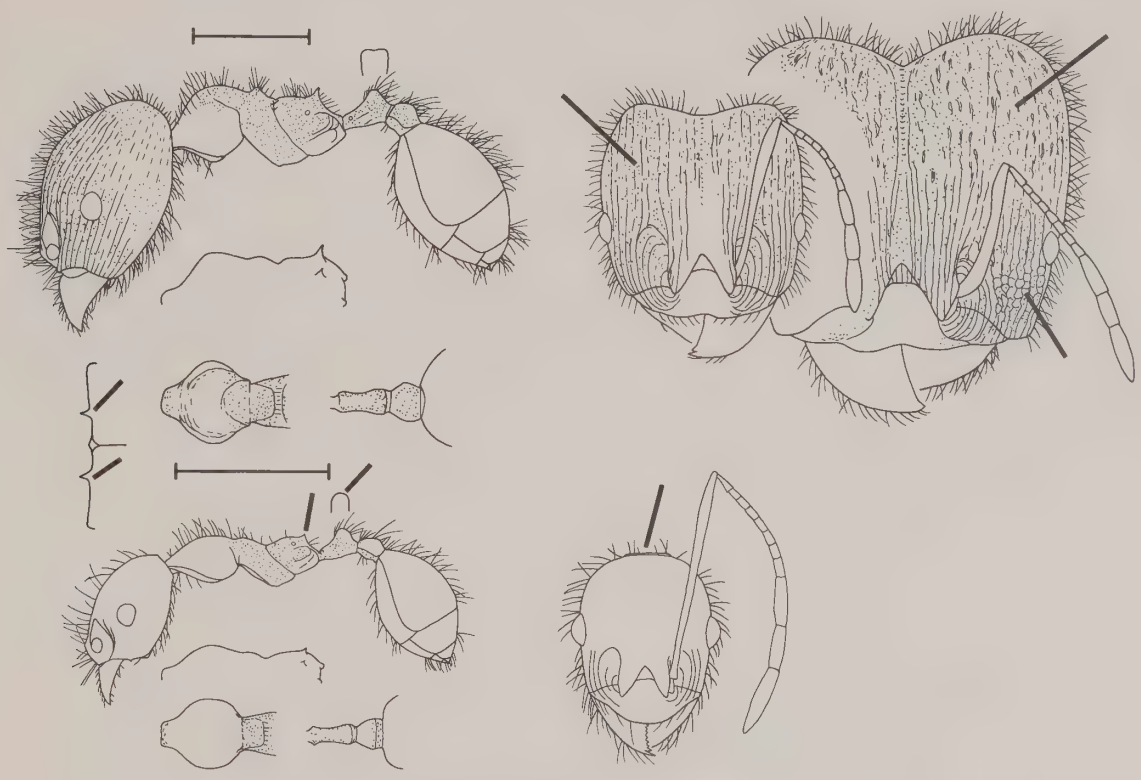


Pheidole militicida Wheeler

Pheidole militicida Wheeler 1915b: 398.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *militicida,* soldier killer, based on Wheeler's mistaken belief that colonies of this species periodically execute their own majors.
DIAGNOSIS A giant species of the *pilifera* group distinguished in addition as follows.
Major: reddish yellow; petiolar node in side view tapering to a blunt point, its apex bearing a transverse carina; the postpetiolar node from above angulate, its crest also bearing a transverse carina; a small, angular subpostpetiolar process present; the posterior half of the head and almost all the rest of the body smooth and shiny; pilosity erect, relatively short, and very dense.
Minor: eye very large, head quadrate in full-face view; humerus lobose in dorsal-oblique view; postpetiolar node depressed; almost all of the body smooth and shiny.
MEASUREMENTS (mm) Syntype major: HW 2.66, HL 2.50, SL 0.96, EL 0.32, PW 1.20.
Syntype minor: HW 0.84, HL 0.92, SL 0.74, EL 0.26,. PW 0.52.
COLOR Major: concolorous reddish yellow. Minor: body dark reddish brown, appendages brownish yellow.
RANGE Southern Arizona, New Mexico, extreme western Texas.
BIOLOGY *P. militicida* builds crater nests, often surrounded by piles of seed chaff in the soil of deserts. Stefan Cover and Gary D. Alpert (unpublished collection data) found nests at 1300–1500 m; winged queens and males are present in at least the first half of July, in separate collections by G. D. Alpert, W. S. Creighton, and S. P. Cover. The species is also a major seed harvester in xeric habitats. Hölldobler and Möglich (1980) have described trunk trails laid out by minors along which thousands of ants travel to the areas where seeds are then harvested and brought back to the nest. The system resembles that of the famous desert harvester ants of the genera *Messor* and *Pogonomyrmex*. The trunk trails start as chemical recruitment trails and are stabilized by more enduring chemical orientation cues and visual markers. And like *Messor,* the workers shift the direction of the foraging pathway or establish a new route when the seed supplies in the target foraging area diminish. Because W. M. Mann and W. M. Wheeler found majors in the nests near Benson, Arizona, in the seed-bearing season of August and remains of majors on the chaff piles in November, Wheeler (1915b) speculated that majors are produced in the colony prior to the harvesting season and killed afterward—hence the name he gave the species. This hypothesis was persuasively discarded but not entirely disproved by Creighton and Gregg (1955). A careful study of the life cycle and division of labor in this unusual species will prove rewarding. The disproportionately huge major suggests that it may also be a storage caste. The majors are also the focus of a myrmecological mystery story.

FIGURE Upper: major, with heads of major (left) and supermajor (right). Lower: minor. ARIZONA: Sunnyside Canyon, Huachuca Mts., Cochise Co. (Stefan Cover). (Type locality: Tepic, Nayarit, collected by Eisen and Vaslit.) Scale bars = 1 mm.



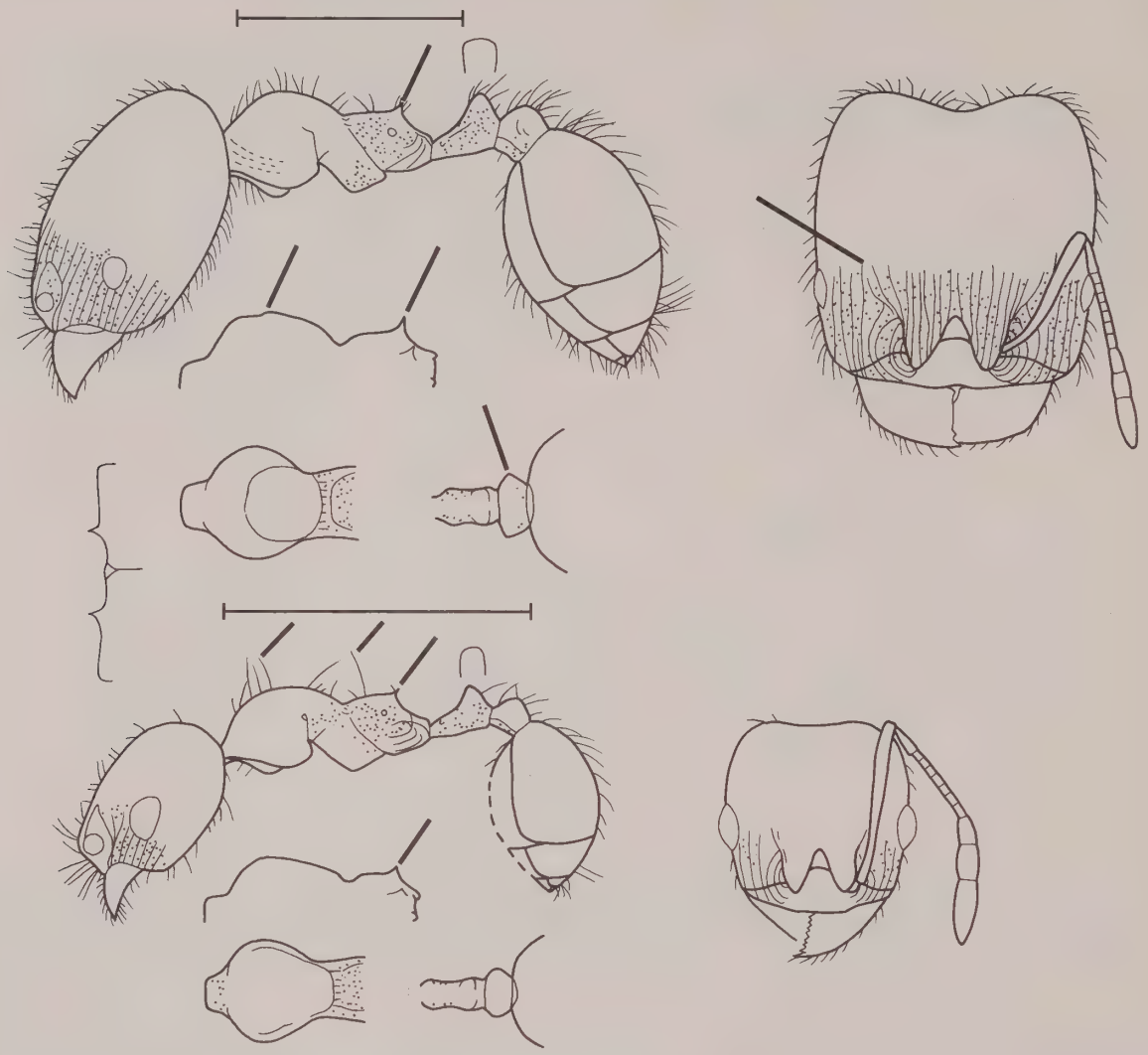
Pheidole obtusospinosa Pergande

Pheidole obtusospinosa Pergande 1896: 889. Junior synonym of *Pheidole subdentata* Pergande 1896: 888, synonymy by Wheeler, 1914c: 50; *subdentata* Pergande is a junior secondary homonym of *Oecophthora subdentata* Mayr 1853b: 145, later transferred to *Pheidole* and a synonym of *P. pallidula* (Nylander) of Eurasia; hence *obtusopilosa* is first available name. Syn.: *Pheidole arizonica* Santschi 1911d: 3, synonymy by Creighton 1958: 211.

TYPES Nat. Mus. Nat. Hist. U. S.
ETYMOLOGY L *obtusospinosa,* with blunt thorns, referring to the propodeal spines.
DIAGNOSIS A large trimorphic species placed in the *pilifera* group because of the 2-toothed hypostoma of the **major** but with other traits conforming to the *fallax* group. Very close to *hirtula,* distinguished most readily in the **supermajor**, as illustrated, by the elongate foveae of the rear half of the dorsum of the head, with the interspaces densely foveolate and opaque. The tangled taxonomic history of this species and the true status of *vaslitii,* previously associated with it but now revealed as a junior synonym or sibling species of *hyatti* (q.v.), have been presented by Ward (2000).
MEASUREMENTS (mm) Supermajor: HW 2.50, HL 2.36, SL 1.12, EL 0.26, PW 1.06.
Major: HW 1.44, HL 1.46, SL 1.12, EL 0.24, PW 0.72.
Minor: HW 0.62, HL 0.80, SL 0.98, EL 0.16, PW 0.44.
COLOR All castes: yellowish to reddish brown.
RANGE Known from the mountains of southern Arizona at 300–1900 m, and from Nayarit to Nuevo Leon in Mexico.
BIOLOGY Stefan Cover (unpublished field notes), who has collected *obtusospinosa* many times in southern Arizona, has found it consistently in woodland, variously composed of different combinations of pine, oak, and juniper. It typically nests under rocks, although Cover found one colony beneath a cow pat and another 2.5 m from the ground in the dead branch of a standing oak tree *(Quercus arizonica)*. Creighton (1958) reports that colonies are much smaller than those of the closely related *hirtula,* and that in southern Arizona nuptial flights occur in early July.

Compare with species in the "*bicarinata* complex"

FIGURE Upper: paratype, major. Lower: paratype, minor. NEVADA: Goldfield, Esmeraldo Co., Mojave Desert (William S. Creighton). Scale bars = 1 mm.



Pheidole paiute Gregg

Pheidole bicarinata subsp. *paiute* Gregg 1959: 17. Raised to species level by G. C. and J. Wheeler 1973e: 75.

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after one of the Amerindian peoples of the southwestern United States.

DIAGNOSIS A member of the "*bicarinata* complex" of the larger *pilifera* group; for a characterization of the complex, see under *bicarinata*.

P. paiute is distinguished within the complex by the following combination of traits.

Major: propodeal spine in side view equilaterally triangular; humerus with a very low denticle in dorsal-oblique view; postpetiolar node laterally angular; sculpturing of head consists of carinulae confined entirely to the part anterior to the level of the posterior margin of the eyes.

Minor: some of the hairs on the promesonotal dorsum are very long; propodeal spines in side view equilaterally triangular.

MEASUREMENTS (mm) Paratype major: HW 1.04, HL 1.14, SL 0.54, EL 0.18, PW 0.46.

Paratype minor: HW 0.50, HL 0.56, SL 0.48, EL 0.12, PW 0.30.

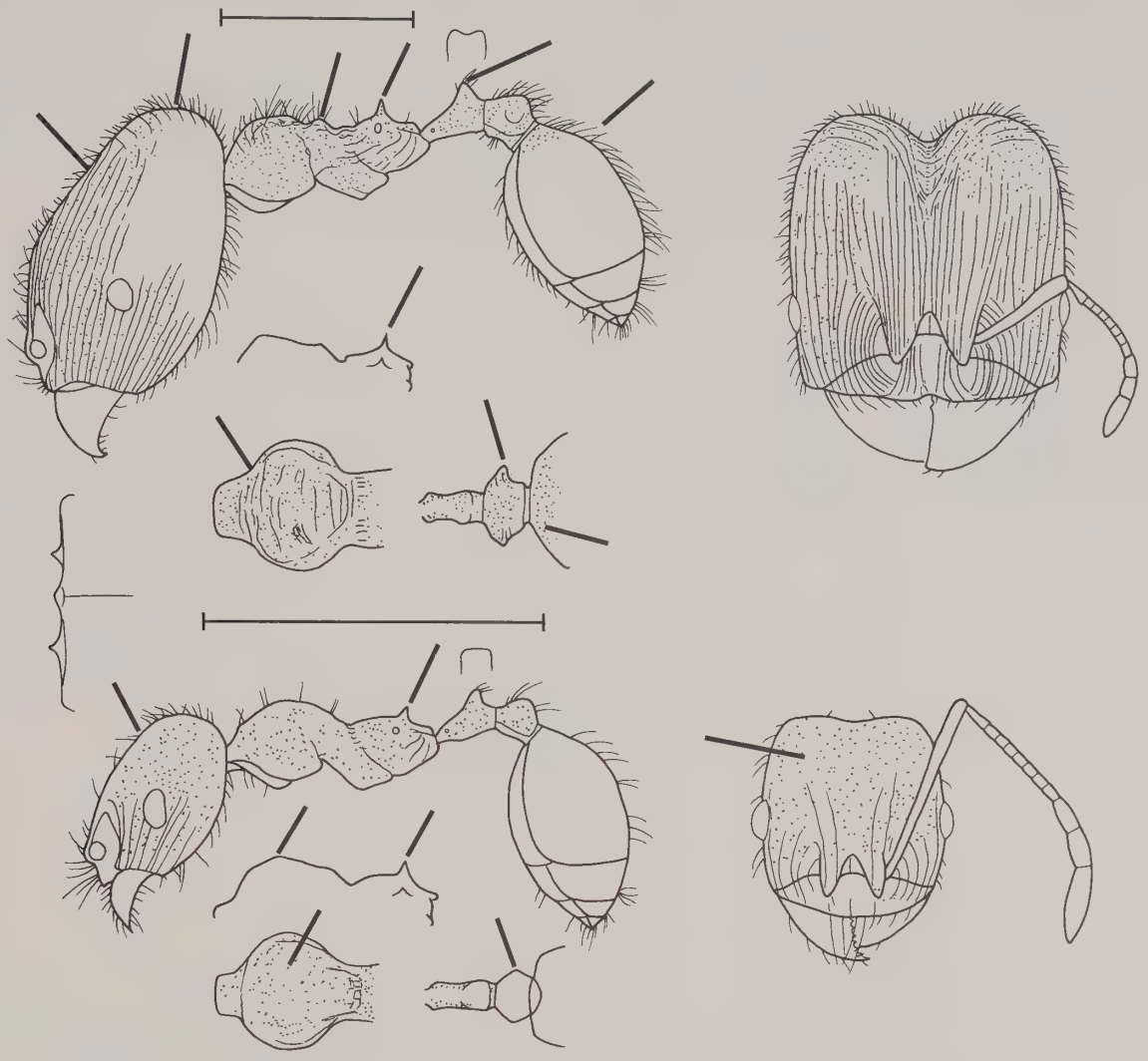
COLOR Major: concolorous dark yellow.

Minor: body brownish yellow, appendages brownish yellow to clear yellow.

RANGE Deserts of Nevada and southern California.

BIOLOGY In Nevada, George C. and Jeanette N. Wheeler (1986g) encountered *paiute* at 1040–2100 m in cottonwood groves, a triplex scrubland, pinyon-juniper woodland, and in disturbed habitats, nesting mostly under stones but also in open soil, where colonies built craters about 25 mm across. At Deep Canyon, near Palm Springs, California, the same authors found the species in larrea-palo verde scrub and desert, nesting in the soil; in one nest excavated, they found a cache of *Oenothera clavaeformis* seeds.

FIGURE Upper: major. Lower: minor. CONNECTICUT: East Haddam. Scale bars = 1 mm.



Pheidole pilifera (Roger)

Leptothorax pilifer Roger 1863a: 180. New combination with *Pheidole* by Emery 1895d: 290. Syn.: *Pheidole pennsylvanica* Roger 1863a: 199, synonymy by Emery 1895d: 290; *Pheidole pilifera* var. *coloradensis* Emery 1895d: 290, raised to subspecies by Wheeler 1908h: 435, n. syn. (provisional); *Pheidole pilifera* subsp. *coloradensis* var. *neomexicana* Wheeler 1908h: 436, unavailable name (quadrinomial), referred to *pilifera* by Creighton 1950a: 187; *Pheidole pilifera* subsp. *coloradensis* var. *simulans* Wheeler 1908h: 436, unavailable name (quadrinomial), referred to *Pheidole* by Creighton 1950a: 186; *Pheidole pilifera* subsp. *septentrionalis* Wheeler 1908h: 437, synonymy by Creighton 1950a: 186; *Pheidole xerophila* subsp. *pacifica* Wheeler 1915b: 04, referred to *Pheidole* by Creighton 1950a: 187, n. syn. (provisional); *Pheidole pilifera* subsp. *artemisia* Cole 1933b: 616, n. syn. (provisional).

TYPES Mus. Naturkunde Humboldt-Univ. Berlin.
ETYMOLOGY Gr *pilifera,* hairy.
DIAGNOSIS A member of the "*pilifera* complex" of the larger *pilifera* group, comprising *calens, californica, carrolli, cavigenis, clementensis, creightoni, hoplitica, littoralis, micula, pilifera, polymorpha, rugulosa, senex, soritis, tepicana,* and *torosa,* which complex is characterized by the following traits. Major: dorsal head surface extensively sculptured; occipital lobe horizontally rugulose (or, in *carrolli* smooth, in *littoralis* foveate, and in *micula* and *soritis* carinulate); postpetiole from above diamond-shaped, trapezoidal, or spinose. Minor: eye medium-sized to large.
P. pilifera is distinguished within its complex by the following combination of traits.
Major: relatively large, HW about 1.6 mm; posterior dorsal profile of head straight or slightly concave; mesonotal convexity prominent and symmetrical in side view; propodeal spines robust, long, and nearly vertical to basal propodeal face; petiolar node in side view tapering apically to a blunt point; postpetiolar node from above very broad relative to petiolar node, and bluntly spinose.
Minor: eyes medium-sized; humerus in dorsal-oblique view subangulate; all of head posterior to the clypeus and mesosoma foveolate and opaque.
Closely related to *carrolli,* but very different in sculpturing of the major.

My synonymy of *artemisia, coloradensis,* and *pacifica* follows Creighton (1950a) in placing them as geographic variants, or subspecies, and thence here into synonymy at the species level. However, this assignment is not well documented and thus is regarded as provisional. The pattern of geographic variation within *pilifera* is as follows. Western populations *("coloradensis")* ranging from North Dakota and Colorado to Nevada display a narrowing of the transverse rugulose band to the rearmost part of the **major** occiput and loss of the longitudinal carinulae on the vertex (anterior to the occiput), an area that is spotted with coarse foveae and shiny interspaces. The trend is climaxed in Nevada and California *("pacifica")* by replacement of the foveae on the vertex of the major by fine punctures. Southwestward, in Utah and Arizona *("artemisia"),* the broad band of occipital rugulae of the **major** in eastern populations ("typical" *pilifera*) is retained, but the carinulae of the vertex are lost and replaced by a shiny surface.

MEASUREMENTS (mm) Major (Haddam, Connecticut): HW 1.60, HL 1.72, SL 0.74, EL 0.24, PW 0.68.
Minor (Haddam): HW 0.54, HL 0.60, SL 0.52, EL 0.12, PW 0.36.

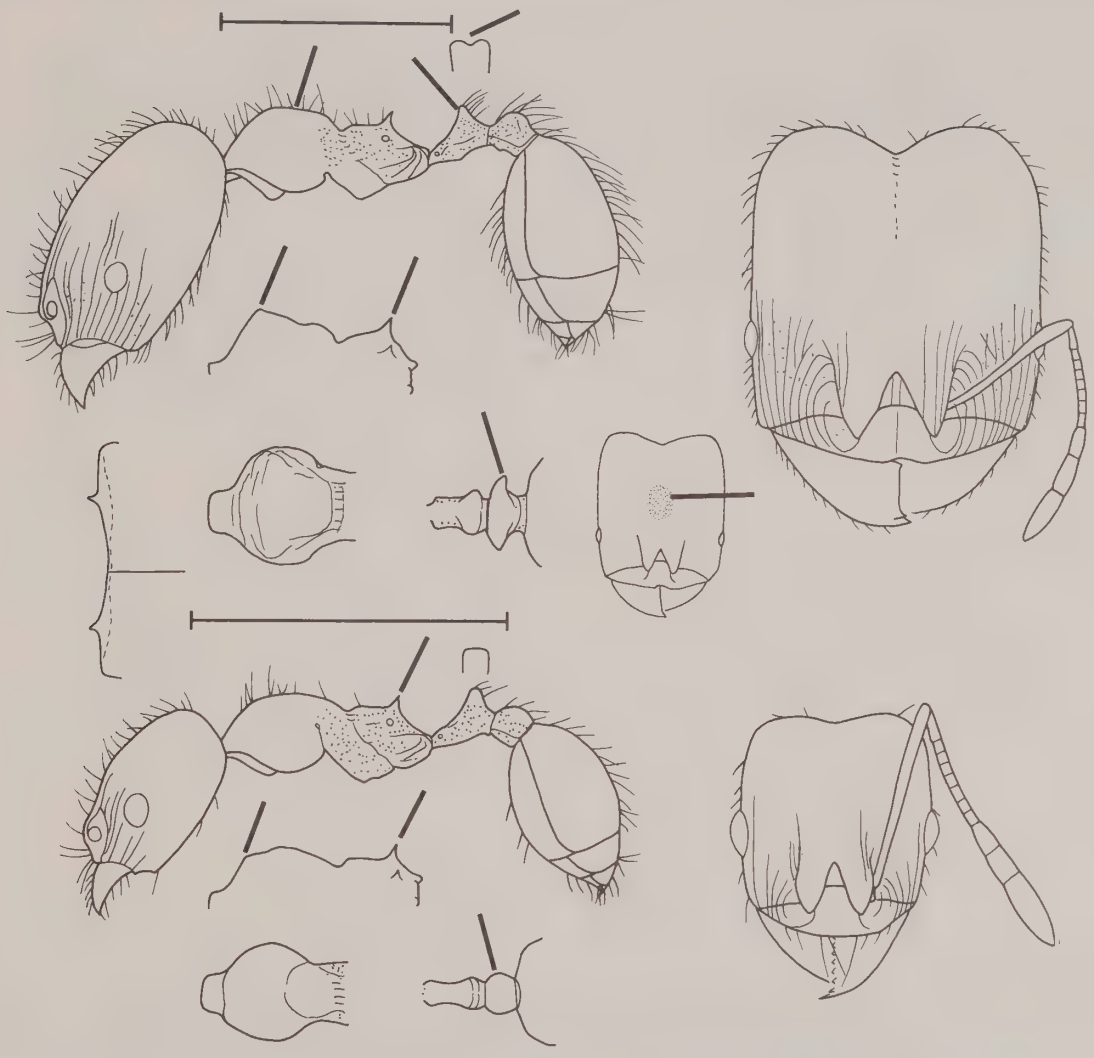
COLOR Major: light reddish brown.
Minor: medium reddish brown.

RANGE *Pheidole pilifera* is the most widespread and northward-reaching of all the Nearctic *Pheidole*. The species, as presently broadly construed, ranges from Massachusetts south to Georgia and west to California, extending through the midwest as far north as Minnesota, North Dakota and southwest to Utah, New Mexico, and Arizona.

BIOLOGY Colonies of *pilifera* excavate crater nests in exposed soil and harvest seeds, which are stored in nest chambers. In Colorado, Gregg (1963) found the species (as "subsp. *coloradensis*") abundant at 1500 to 2600 m, in a wide range of habitats, from short-grass prairie, roadsides, and herbaceous semi-desert to mixed canyon forest and mountain mahogany shrub. Sexuals were present in the nest from the first week in June to the last week in July. *P. pilifera* is also notable in Colorado as the host of the social parasite *Pheidole inquilina*. In Nevada, *pilifera* ranges between 900 and 2300 m, nesting in desert and juniper-pinyon woodland, both under stones and in the open soil, where it forms craters 25–60 mm wide (G. C. and J. Wheeler 1986g). According to Stefan Cover (personal communication), "In the eastern U. S. *pilifera* occurs in open, grassy habitats, especially those with sandy soils containing a little clay. It is less common in pure sand, thus in pine barrens. Mating flights occur in early to mid July. Colonies are monogynous, and the newly mated queens start colonies singly. Minors are 'shy' foragers but recruit to good food sources. Majors seldom leave the nest except when recruited. Their primary function is to block nest passages, which they do effectively."

Compare with species listed in the Diagnosis below

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. TEXAS: Limpio Canyon, Ft. Davis, Davis Mts., Jeff Davis Co., southwestern Texas (W. M. Wheeler). Scale bars = 1 mm.



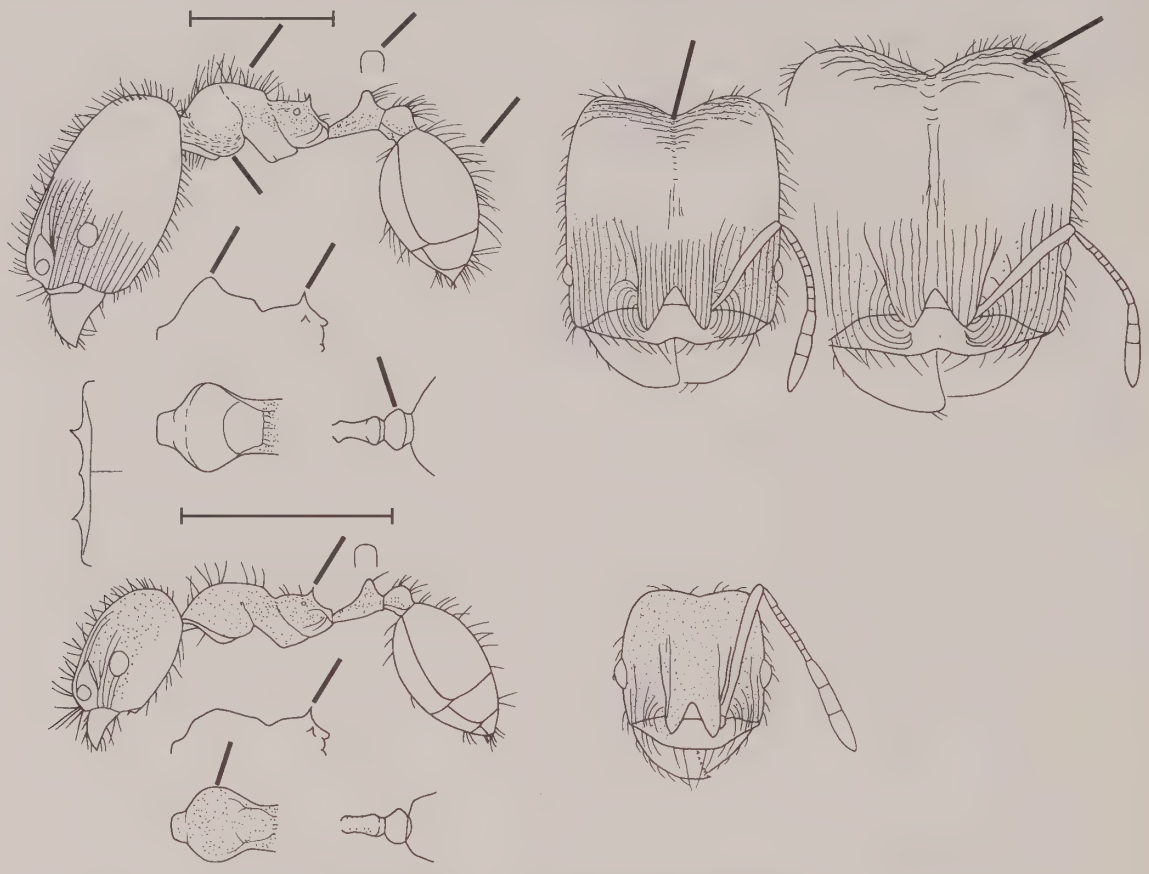
Pheidole pinealis Wheeler

Pheidole pinealis Wheeler 1908h: 459.

TYPES Mus. Comp. Zool. Harvard; Amer. Mus. Nat. Hist.
ETYMOLOGY Unknown.
DIAGNOSIS A member of the "*bicarinata* complex" of the larger *pilifera* group, comprising *agricola, aurea, barbata, bicarinata, centeotl, cerebrosior, ceres, defecta, gilvescens, macclendoni, macrops, marcidula, paiute, pinealis, vinelandica, xerophila, yaqui,* and *yucatana,* which complex is characterized by the large to very large, forward-set eyes, especially in the minor; and in the major, the occipital lobes lacking any sculpturing (except in *aurea*); the posterior half of the head capsule smooth and shiny; and the postpetiole seen from above oval, elliptical, or laterally angulate (cornulate in *cerebrosior*).
P. pinealis differs within the complex by the following combination of traits.
Major: dark spot on vertex; humerus in dorsal-oblique view right-angulate; petiole in side view tapers to a point, and from behind is deeply concave; postpetiolar lateral extension from above horn-shaped; erect pilosity of pronotum long and dense.
Minor: humerus in dorsal-oblique view feebly subangulate; postpetiole from above roughly diamond-shaped.
MEASUREMENTS (mm) Lectotype major: HW 1.06, HL 1.24, SL 0.52, EL 0.14, PW 0.54.
Paralectotype minor: HW 0.48, HL 0.54, SL 0.46, EL 0.10, PW 0.30.
COLOR Major: head and mesosoma light brown with a slightly reddish tinge; center of head dorsum with contrasting circular dark brown spot, as illustrated; waist and gaster dark brown; appendages brownish yellow.
Minor: concolorous medium brown (brownish yellow, possibly faded, in paralectotype); appendages yellowish brown.
RANGE Known only from western Texas and a series from Guanajuato, central Mexico.
BIOLOGY The type colony was found beneath a stone; the nest contained seed caches (Wheeler 1908h). In western Texas, Moody and Francke found three colonies, variously at 1000–1200 m, nesting, respectively, beneath a stone and cow dung and in open soil.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major; partial head in full-face view of paratype, supermajor. Lower: paratype, minor. MEXICO: Highway 57, km 127, Estado México (Cornell University Field Party, 1965). Scale bars = 1 mm.



Pheidole polymorpha **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *polymorpha,* many forms, referring to the coexistence of major and supermajor castes.

DIAGNOSIS A member of the "*pilifera* complex" of the larger *pilifera* group, comprising *calens, californica, carrolli, cavifrons, clementensis, creightoni, hoplitica, littoralis, micula, pilifera, polymorpha, rugulosa, senex, soritis, tepicana,* and *torosa,* which complex is distinguished by the following traits. Major: dorsal head surface extensively sculptured; occipital lobes transversely rugulose (or, in *carrolli* smooth, in *littoralis* foveate, and in *micula* and *soritis* carinulate); postpetiole from above diamond-shaped, trapezoidal, or spinose. Minor: eye medium-sized to large.

P. polymorpha is distinguished within the complex by the following combination of traits. Worker caste trimorphic, with major, supermajor, and minor.

Major: humerus very pronounced and subtriangular in shape in dorsal-oblique view; propodeal spines stout and vertical to the basal propodeal face; postpetiole from above with sharp right-angular margins; pilosity, long and dense.

Minor: all of mesosoma and almost all of the dorsal head surface foveolate and opaque.

Both **major** and **minor**: dorsal margin of petiole seen from behind strongly convex.

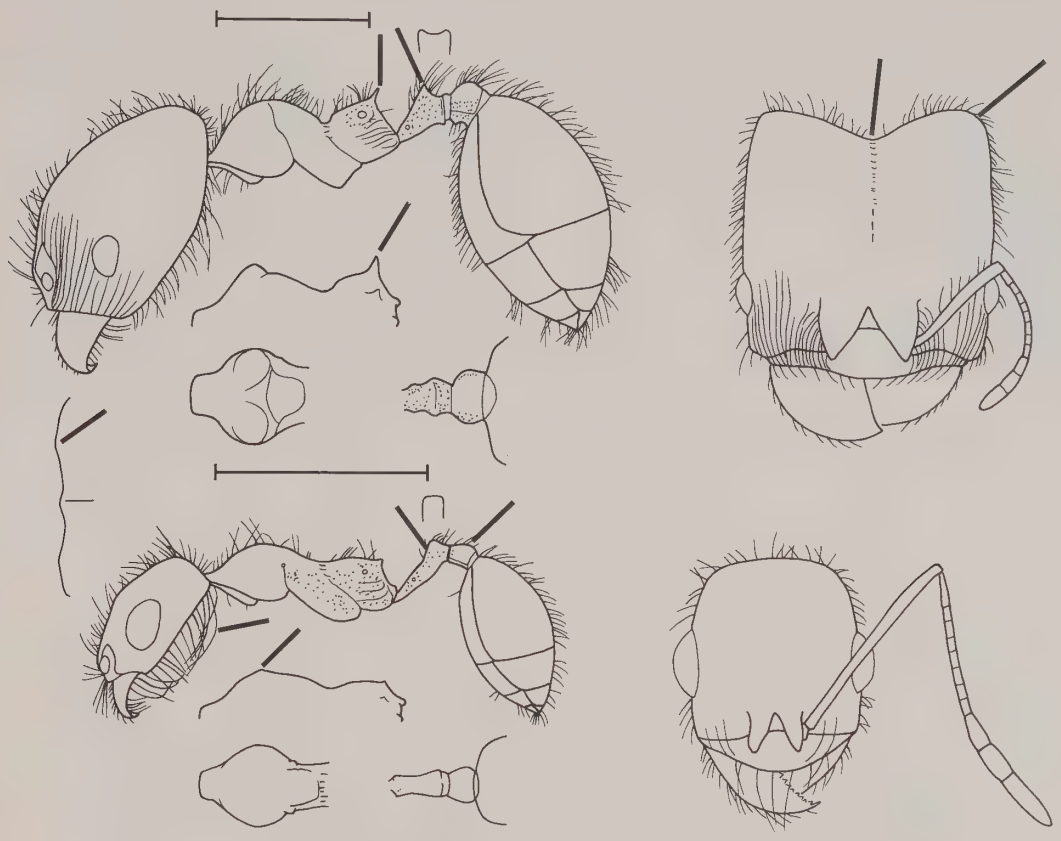
MEASUREMENTS (mm) Holotype major: HW 1.34, HL 1.46, SL 0.62, EL 0.20, PW 0.60.
Paratype minor: HW 0.54, HL 0.60, SL 0.56, EL 0.14, PW 0.38.

COLOR Major and minor: brownish yellow.

RANGE Known only from the type locality and from Chapulco, Puebla, Mexico.

BIOLOGY Collected in upland desert. Comment by Stefan Cover (personal communication): "A very interesting beast; it is like *P. artemisia* or *P. cavigenis* on steroids."

FIGURE Upper: syntype, major. Lower: syntype, minor. CALIFORNIA: 8 km east of Grey's Well, Imperial Co., 50 m (William S. Creighton). Scale bars = 1 mm.

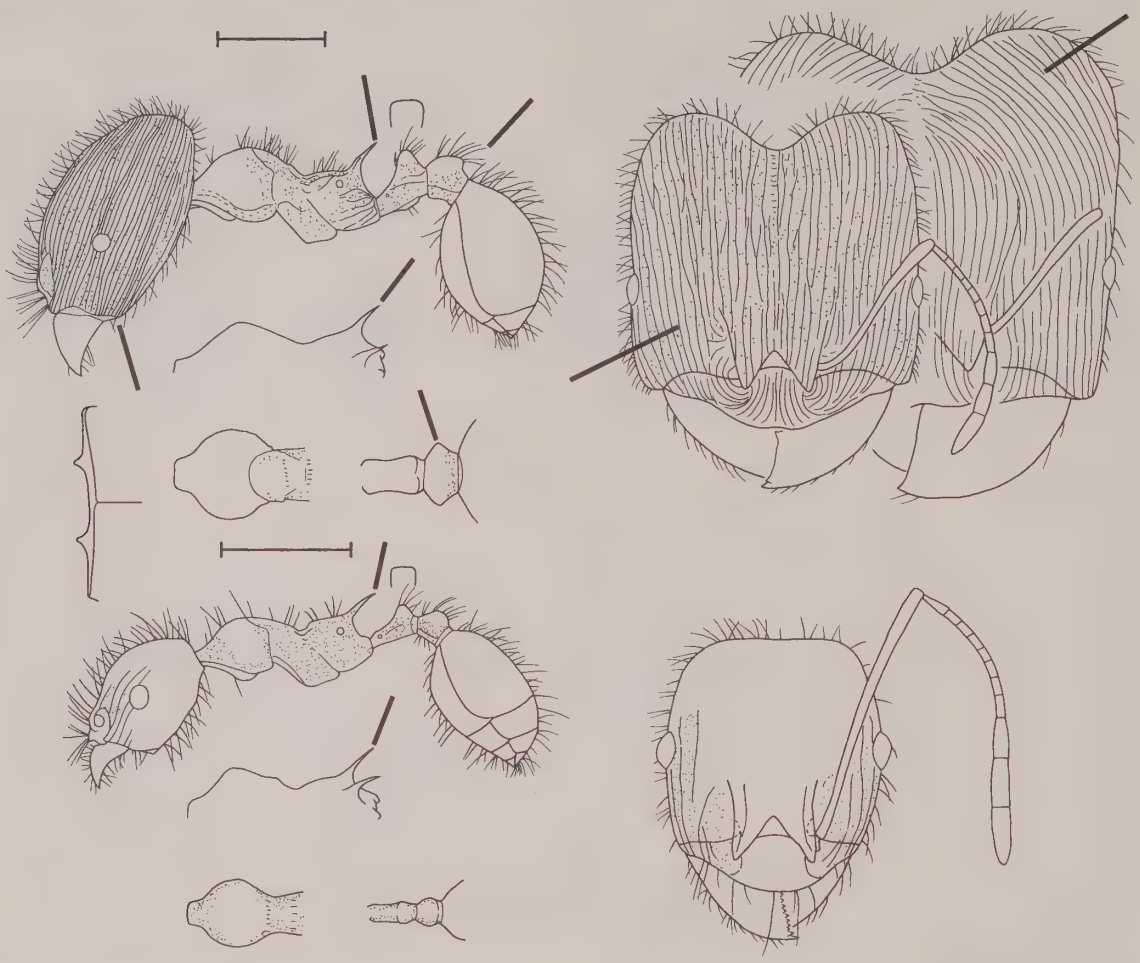


Pheidole psammophila Creighton and Gregg

Pheidole psammophila Creighton and Gregg 1955: 15.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *psammophila,* sand-lover, referring to the nest-site preference (see below).
DIAGNOSIS A member of the "*bicarinata* complex" of the larger *pilifera* group, comprising *agricola, aurea, barbata, bicarinata, centeotl, cerebrosior, defecta, gilvescens, macclendoni, macrops, marcidula, paiute, pinealis, vinelandica, xerophila, yaqui,* and *yucatana (psammophila* is closest to *barbata),* which complex is characterized by the large to very large, forward-set eyes of both castes; and, in the major, the occipital lobes lacking any sculpturing (except in *aurea*); the posterior half of the head capsule almost entirely smooth and shiny; and the postpetiolar node seen from above oval, elliptical, or laterally angulate (cornulate in *cerebrosior*). *P. psammophila* is distinguished within the complex by the following combination of traits.
Major: hypostoma lacking teeth; humerus in dorsal-oblique view subangulate; petiolar node in side view tapered to a point; small subpostpetiolar process visible in side view; occipital lobes subangulate.
Minor: lower surface of head flat and bearing very long hairs curved to form a basket (psammophore). Petiole long and thin and petiolar and postpetiolar nodes very low.
MEASUREMENTS (mm) Syntype major: HW 1.60, HL 1.72, SL 0.80, EL 0.30, PW 0.72.
Syntype minor: HW 0.54, HL 0.68, SL 0.62, EL 0.24, PW 0.38.
COLOR Major: head and mandibles clear reddish yellow, mesosoma and waist medium reddish brown, gaster and appendages light reddish brown.
Minor: body concolorous medium brown, mandibles a contrasting clear yellow, other appendages light brown.
RANGE Sandy deserts of southern California, western Arizona, and Sonora, northern Mexico, sea level to 75 m (Creighton and Gregg 1955).
BIOLOGY All of the nests found by Creighton and reported in Creighton and Gregg (1955), as well as by Stefan Cover (unpublished notes), were in sand, especially sand subject to frequent shifting, an extreme environment avoided even by other desert-dwelling ants. The remarkable psammophore (basket-like enclosure of hairs between the head, used to carry sand or other loose particles) is likely an adaptation to the environment for which the species is specialized. Chaff piles occurred around the nest entrances of some of the nests, an almost certain sign that *psammophila* harvests seeds.

FIGURE Upper: major, with partial view of supermajor head at far right. Lower: minor. ARIZONA: Stratton, Santa Catalina Mts., northeast of Tucson. (Type locality: Nogales, Arizona.) Scale bars = 1 mm.

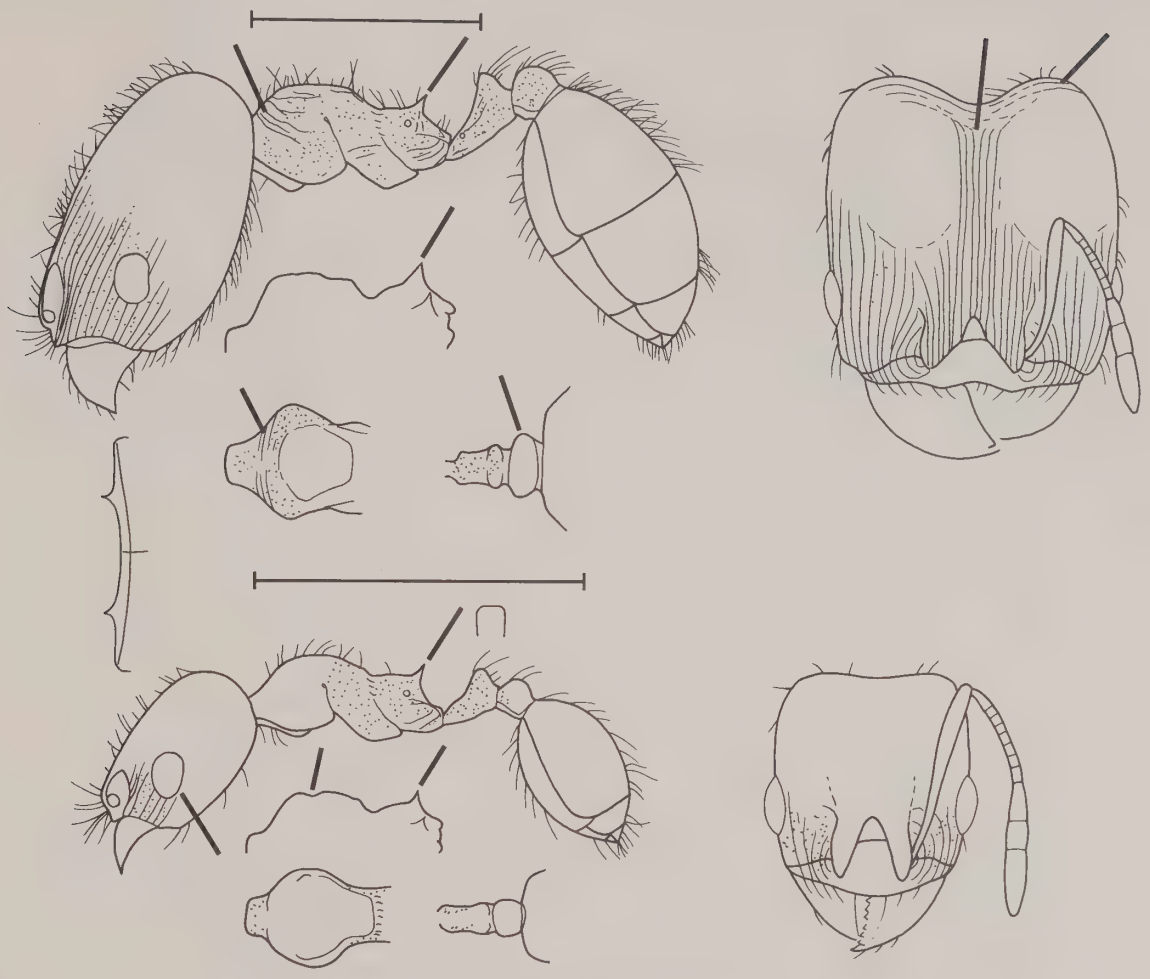


Pheidole rhea Wheeler

Pheidole rhea Wheeler 1908h: 452.

TYPES Unique holotype queen: Department of Entomology Collection, Cornell University, Ithaca, New York.
ETYMOLOGY NL *rhea,* a South American genus of ostrichlike birds, allusion unknown.
DIAGNOSIS A giant species, reddish to dark brown, tentatively placed in the *pilifera* group because of the bidentate hypostoma and presence of a supermajor, but with overall appearance similar to some species of the *fallax* group. Trimorphic, with major, supermajor, and minor castes, as illustrated. Also distinguished as follows.
Major: head completely covered everywhere except on frontal triangle by dense longitudinal carinulae; promesonotum smoothly convex in both side and dorsal-oblique views; propodeal spines very long; posterior face of propodeum descends vertically; postpetiole diamond-shaped from above.
Supermajor: propodeum descends vertically; postpetiole diamond-shaped from above; cephalic sculpturing as in **major**, except that the carinulae of the dorsal face behind the level of the eye curve inward toward the cephalic midline.
Minor: very long propodeal spines, as illustrated.
MEASUREMENTS (mm) All castes measured are from Stratton, Santa Catalina Mts., Arizona.
Supermajor: HW 3.86, HL 4.04, SL 1.68, EL 0.38, PW 1.38.
Major: HW 2.52, HL 2.76, SL 1.40, EL 0.26, PW 1.04.
Minor: HW 0.86, HL 0.96, SL 1.06, EL 0.16, PW 0.58.
COLOR Major and minor: body light reddish brown, except for the gaster, which is a slightly contrasting dark reddish brown.
RANGE Southern Arizona south into Mexico.
BIOLOGY The species is found on plateaus and among foothills at the bases of mountains across a wide elevational range, from 1100 to 2100 m, with an apparent preference for the lower end (Creighton 1950a: 168). According to Stefan Cover (personal communication), it "forms enormous colonies surmounted by sloppy craters or under rocks, chiefly on open, rocky slopes. Seeds are harvested in large quantities, but the ants are active predators as well. Mature colonies have well-developed trunk-trail systems. Minors and medias forage, but large majors and supermajors are seldom seen outside the nests. The ants are aggressive, and all size classes actively defend the nest."

FIGURE Upper: paratype, major. Lower: paratype, minor. ARIZONA: Tucson. Scale bars = 1 mm.



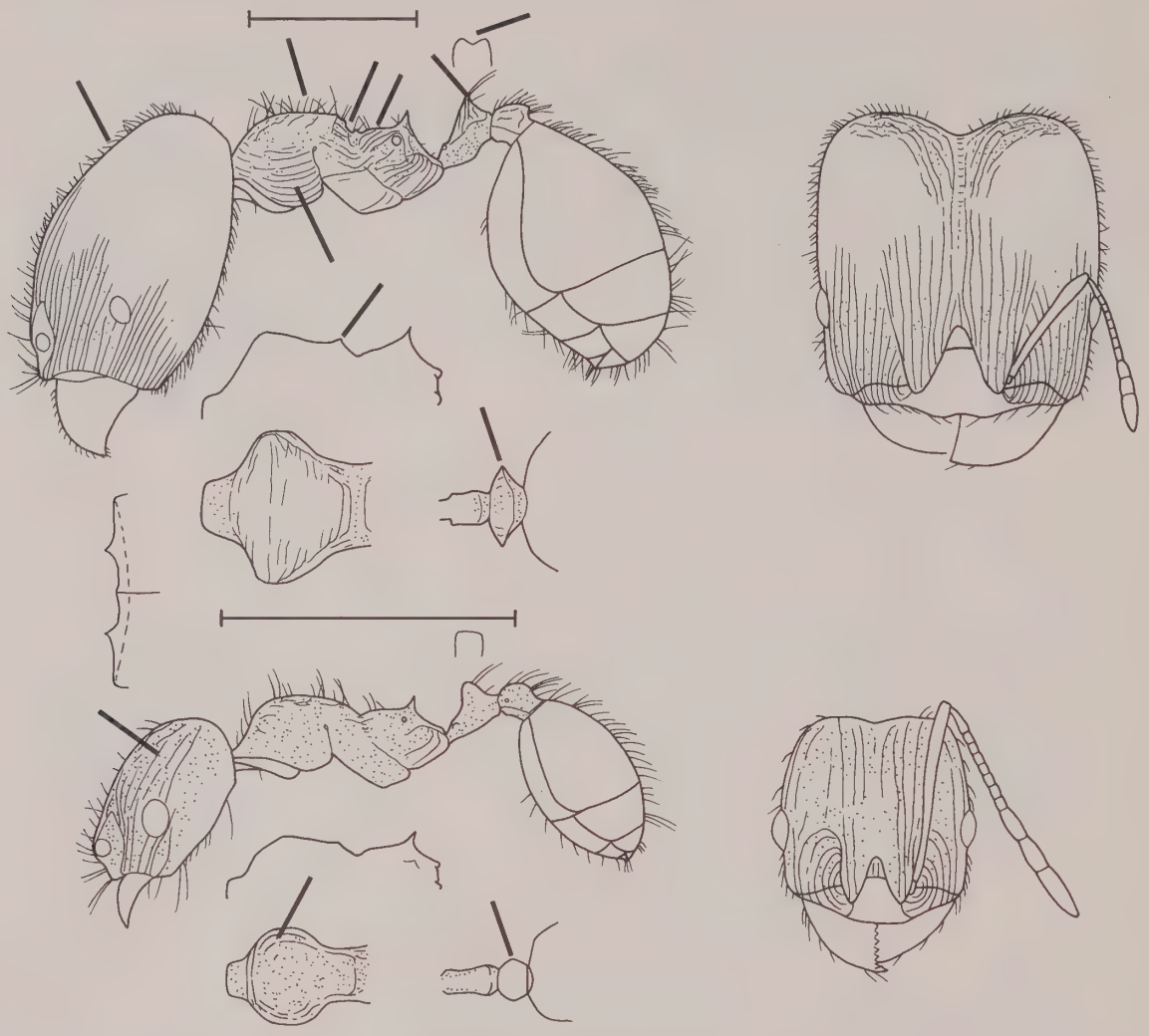
Pheidole rugulosa Gregg

Pheidole rugulosa Gregg 1959: 26.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *rugulosa,* a small amount of wrinkling, evidently referring to the occipital rugulation.
DIAGNOSIS A member of the "*pilifera* complex" of the larger *pilifera* group; for a characterization of the complex, see under *pilifera*.
P. rugulosa is distinguished within the complex by the following combination of traits.
Major: rugulae on occiput seen in full-face view limited to a narrow strip; longitudinal carinulae originating on the frontal triangle travel all the way to meet the occipital rugulae, but other cephalic carinulae do not reach beyond the midpoint of the head capsule; anterior strip of the pronotum transversely carinulate; mesonotal convexity very low; postpetiole seen from above laterally angulate.
Minor: exceptionally large, forward-placed eyes; mesonotal convexity present in dorsal-oblique view; propodeal spines well developed.
Throughout much of southern New Mexico and Arizona, *P. rugulosa* occurs with *P. soritis,* with which it is easily confused.
P. rugulosa is most easily distinguished from that species by the major's well-developed humeral angles, which are inconspicuous and rounded in *soritis,* and the large shiny areas on the posterior dorsal surface of the head, which is variably sculptured in *soritis*.
MEASUREMENTS (mm) Paratype major: HW 1.04, HL 1.12, SL 0.54, EL 0.22, PW 0.56.
Paratype minor: HW 0.52, HL 0.52, SL 0.42, EL 0.14, PW 0.44.
COLOR Major: reddish to medium brown, gaster often somewhat darker. Minor: medium to dark brown, even blackish.
RANGE Texas, New Mexico, Arizona.
BIOLOGY Stefan Cover (unpublished collection notes) found numerous colonies of *rugulosa* in the deserts of southern Arizona and southwestern New Mexico at 1300–1700 m, in xeric habitats ranging from grazed grassland desert to rabbitbrush-mesquite desert, mesquite-acacia dominated wash, and riverbank desert scrub. The ants usually nest in the open soil, with the entrances surrounded by either crescentic or full craters; the entrance of one nest was in a grass clump. Similar nest site preferences are reported from western Texas by Moody and Francke (1982). According to Cover, colonies may consist of several hundred individuals or more, and, unusually for *Pheidole,* are at least sometimes polygynous. Seeds are occasionally found in the nests.

Compare with species listed in the Diagnosis below, especially *torosa*

FIGURE Upper: paratype, major. Lower: paratype, minor. COLORADO: 14 km south of Campo, Baca Co., extreme southeastern Colorado (Robert E. Gregg). Scale bars = 1 mm.



Pheidole senex Gregg

Pheidole senex Gregg 1952a: 1. Syn.: *Pheidole pilifera* subsp. *anfracta* Cole 1952c: 278, synonymy by Cole 1953g: 298.

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *senex,* old, senior, possibly alluding to rugulose sculpture of head and mesosoma.

DIAGNOSIS A member of the "*pilifera* complex" of the larger *pilifera* group, comprising *calens, californica, carrolli, cavigenis, clementensis, creightoni, hoplitica, littoralis, micula, pilifera, polymorpha, rugulosa, senex, soritis, tepicana,* and *torosa,* which complex is distinguished by the following traits. Major: dorsal head surface extensively sculptured; occipital lobes transversely rugulose (or, in *carrolli* smooth, in *littoralis* foveate, and in *micula* and *soritis* carinulate), postpetiole from above diamond-shaped, trapezoidal, or spinose. Minor: eye medium-sized to large.

P. senex is distinguished within the complex by the following combination of traits.

Major: large; mesonotal convexity subangulate in dorsal-oblique view, and descends steeply to metathorax in side view; petiolar node tapers to a point in side view; postpetiole from above spinose; sides of pronotum, mesonotum, and propodeum, longitudinally carinulate; anterior dorsal profile of head flat; cephalic pilosity short and erect.

Minor: entire dorsal surface of head except mid-section of clypeus longitudinally carinulate; all of mesosoma foveolate and opaque.

MEASUREMENTS (mm) Paratype major: HW 1.74, HL 1.86, SL 0.78, EL 0.22, PW 0.82.
Paratype minor: HW 0.64, HL 0.66, SL 0.68, EL 0.14, PW 0.40.

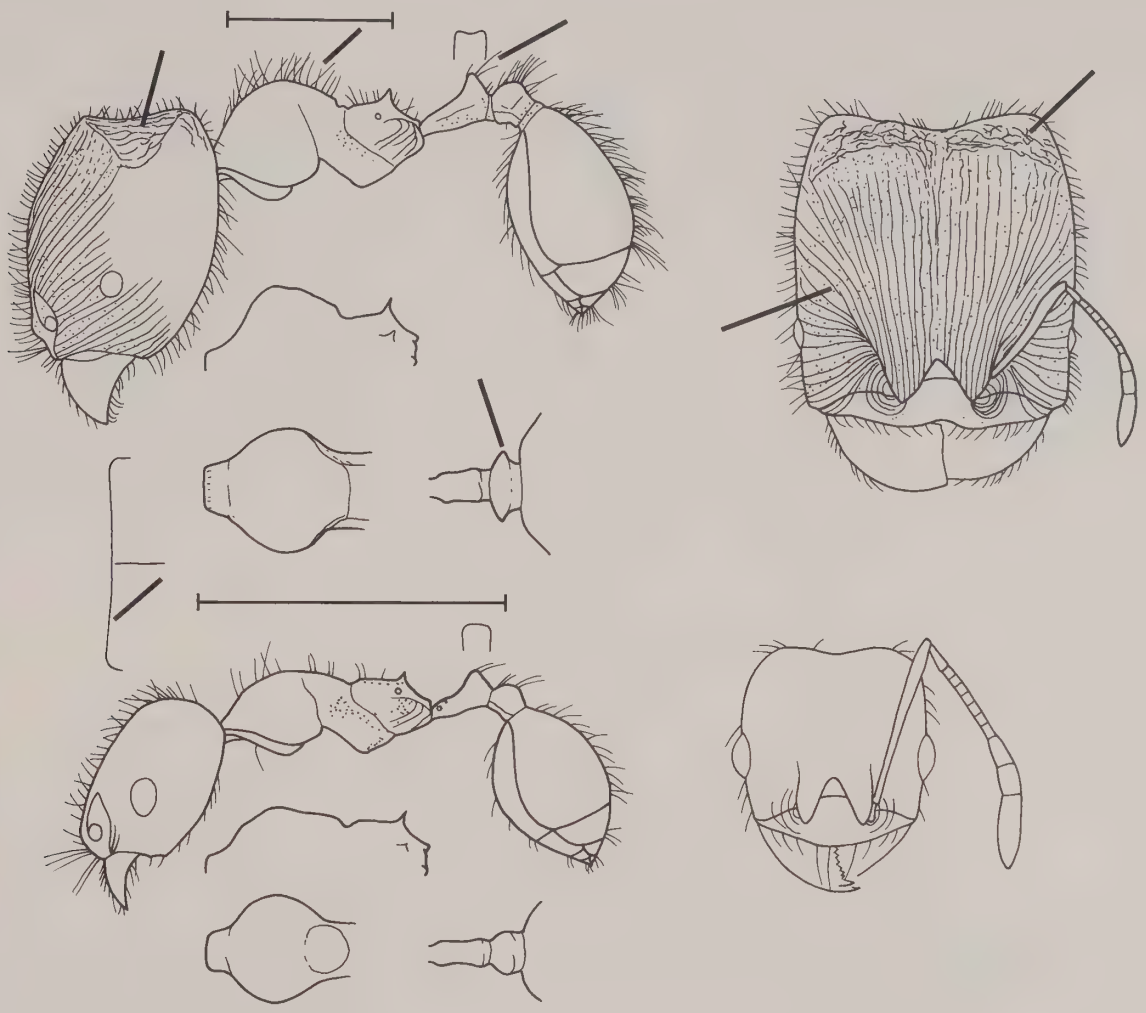
COLOR Major and minor: light yellowish to reddish brown.

RANGE West-central Arizona through New Mexico to the Texas Panhandle and southern Colorado; apparently rare.

BIOLOGY Gregg (1963) reports *P. senex* from Campo, Colorado, in short grass prairie nesting in clay under rocks at 1300 m. Cole recorded it in New Mexico from 2000 to 2700 m. At Springerville, Arizona, I found a colony under a rock in grassy desert. In the Texas Panhandle, Moody and Francke (1982) found two colonies, one beneath a stone and the other in open soil.

Compare with species listed in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: 59 km north of Culiacan, Sinaloa (Robert J. Hamton). Scale bars = 1 mm.



Pheidole setsukoae **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after Barbara Setsuko Hamton.

DIAGNOSIS A member of the *pilifera* group uniquely distinguished within not just *Pheidole* but ants as a whole by the phragmotic condition of the occiput of the **major**, as illustrated. Also distinctive in the **major**, although not unique, are the lack of hypostomal dentition; the high, smoothly rounded outline of the promesonotum in side view; the dense parallel longitudinal carinulae that radiate from the antennal fossae and antennal lobes to the sides of the head; and the conulate postpetiolar node. The **minor** is typical of the "*bicarinata* complex" (see under *bicarinata*).

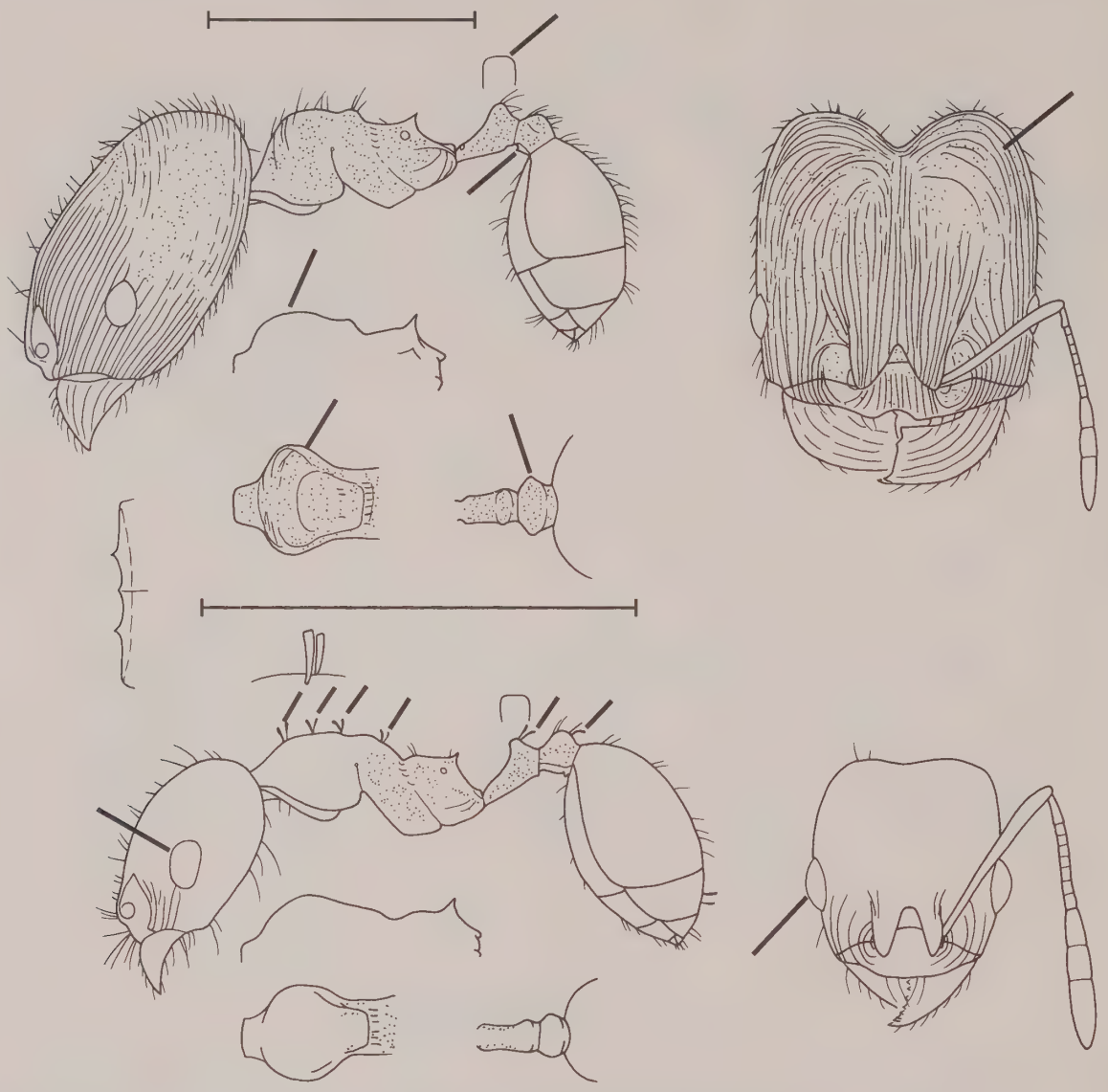
MEASUREMENTS (mm) Holotype major: HW 1.38, HL 1.54, SL 0.62, EL 0.14, PW 0.76.
Paratype minor: HW 0.50, HL 0.54, SL 0.60, EL 0.12, PW 0.30.

COLOR Major: concolorous clear yellow with a very slight orange tinge ("light orange").
Minor: clear medium yellow; dorsal surface of head slightly infuscated, i.e., dark yellow to light brownish yellow.

RANGE Known only from the type locality.

BIOLOGY Robert J. Hamton (*in litt.* 1990): the majors and minors were foraging in a single file to dead moths at a blacklight (ultraviolet light used to attract insects).

FIGURE Upper: syntype major of synonymous *sitarches*. Lower: syntype minor of synonymous *sitarches*. NEW MEXICO: Albuquerque. Scale bars = 1 mm.



Pheidole soritis Wheeler

Pheidole soritis Wheeler 1908h: 439. Syn.: *Pheidole sitarches* Wheeler 1908h: 440, n. syn. (see history of earlier synonymy and revival in Bolton 1995b: 330); *Pheidole sitarches* var. *transvarians* Wheeler 1908h: 442, synonymy by Creighton 1950a: 189; *Pheidole sitarches* subsp. *rufescens* Wheeler 1908h: 443, n. syn. (name takes precedence over *campestris* Wheeler, see below and Bolton 1995b: 318, 329).; *Pheidole sitarches* subsp. *campestris* Creighton 1950a: 189, n. syn. (first available name of *Pheidole sitarches* subsp. *rufescens* var. *campestris* Wheeler 1908h: 443, a quadrinomial not available for use; see further nomenclatural details in Bolton 1995b: 318, 329). Raised to species level in this monograph: *cavigenis*.

TYPES Mus. Comp. Zool. Harvard; Amer. Mus. Nat. Hist.
ETYMOLOGY Unknown.
DIAGNOSIS A member of the "*pilifera* complex" of the larger *pilifera* group, comprising *calens, californica, carrolli, cavigenis, clementensis, creightoni, hoplitica, littoralis, micula, pilifera, polymorpha, rugulosa, senex, soritis, tepicana,* and *torosa,* which complex is distinguished by the following traits. Major: dorsal head surface extensively sculptured; occipital lobe transversely rugulose (or, in *carrolli* smooth, in *littoralis* foveate, and in *micula* and *soritis* carinulate); postpetiole from above diamond-shaped, trapezoidal, or spinose. Minor: eye medium-sized to large.
P. soritis is distinguished within this complex by the following combination of traits.
Major: extensive transverse carinulae of occiput curve laterally and forward, with many reaching the anterior border of the head capsule; almost entire dorsal surface of head, including clypeus, carinulate; rugulae lacking on head; humerus low and smoothly convex; postpetiole seen from above laterally angulate; small denticle present on anterior ventral surface of postpetiole in side view.

Minor: dorsal profile of promesonotum lined solely with evenly spaced pairs of clavate hairs; similar hairs occur on the waist; eye very large.

The tangled infraspecific nomenclature of this species has been built mostly on variation in the sculpturing of the minor's head. From central Texas north and west, the posterior dorsal surface is foveolate and opaque (subsp. *rufescens* = subsp. *campestris*). To the south, into Mexico, it is smooth and shiny, as illustrated here (subsp. *sitarches*). Westward to Arizona and Utah it is carinulate (typical *soritis*). Whether this variation is truly geographic within a single species or reflects the existence of sibling species around *sitarches* sensu str., is a question that awaits closer field and museum research.

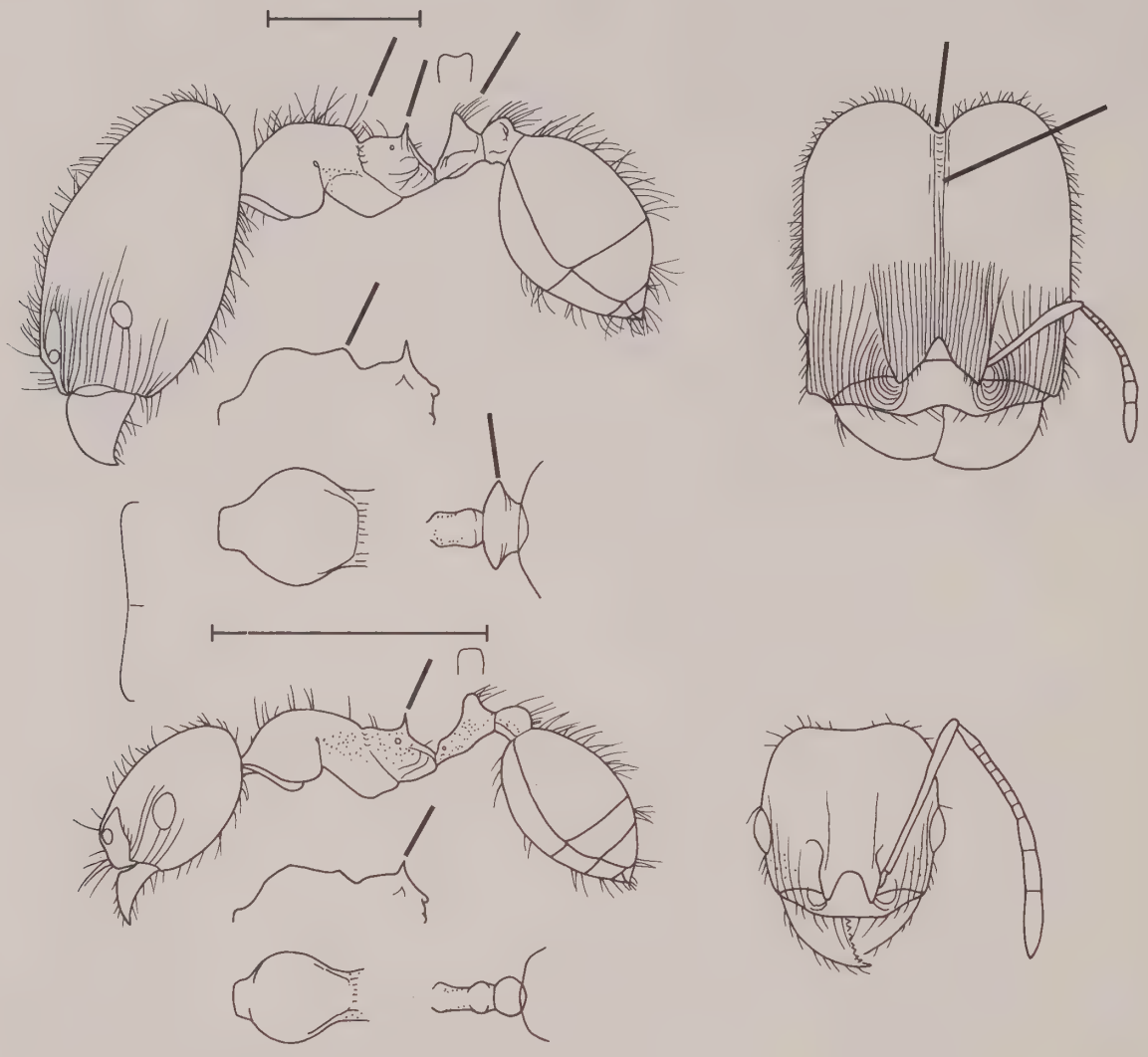
MEASUREMENTS (mm) Lectotype *soritis* major: HW 1.16, HL 1.22, SL 0.60, EL 0.20, PW 0.52.
Syntype *sitarches* minor (no type *soritis* minors available): HW 0.46, HL 0.50, SL 0.48, EL 0.12, PW 0.30.

COLOR Major: head and appendages light reddish brown, body a slightly contrasting medium reddish brown.
Minor: body plain light brown, appendages brownish yellow.

RANGE Mississippi west to Colorado, Texas, Arizona, and northern Mexico.

BIOLOGY In eastern Colorado, Gregg (1963) found *P. soritis* under rocks in the clay soil of cottonwood-willow woodland and shortgrass prairie, from 1000 to 1300 m. I encountered it near Datil, New Mexico, in open juniper woodland (Wilson 1957c). A nuptial flight was observed in progress following rainfall on 9 August in an abandoned homesite clearing. The swarms of flying ants, which held resolutely to the clearings, consisted mostly of males. The aggregations were roughly circular in shape and hovered from about half a meter to nearly 2 meters above the surface, depending on wind conditions. Winged queens flew into the swarms and were quickly seized by a male, whereupon the pair spiraled to the ground together. After insemination, the queens shed their wings and ran off over the ground, evidently in search of a nest site.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ARIZONA: Santa Cruz River, Tucson (W. M. Wheeler). Scale bars = 1 mm.

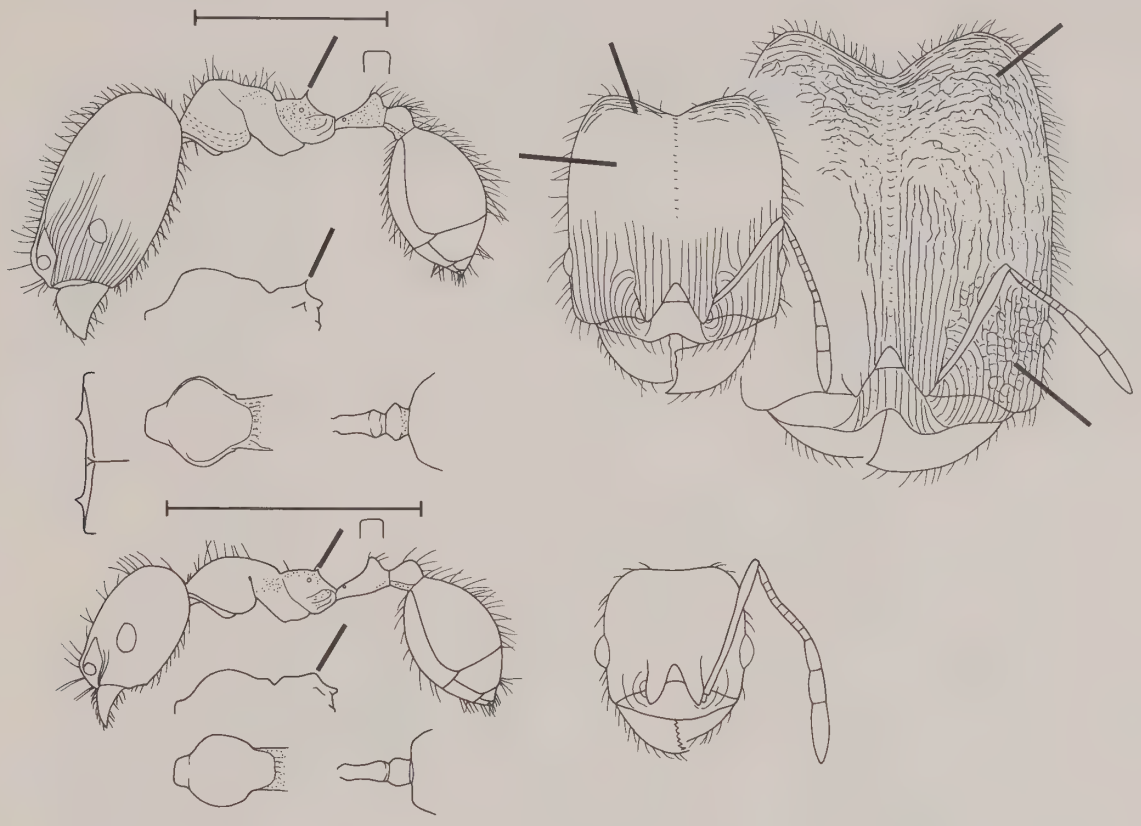


Pheidole spadonia Wheeler

Pheidole spadonia Wheeler 1915b: 400.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *spadonia,* impotent, sterile; allusion unknown.
DIAGNOSIS A large reddish yellow (light "orange") member of the *pilifera* group.
Major: anterior half of head densely carinulate, with a few carinulae traveling along the dorsal midline all the way to the occiput, and the entire remainder of the body smooth and shiny; propodeal spines well-developed and vertical to the basal propodeal face; the petiolar node seen from the side tapering to a point; the postpetiole seen from above very broad, and spinose.
Minor: propodeal spines well-developed and vertical to basal propodeal face; almost all of the head and mesosoma smooth and shiny.
MEASUREMENTS (mm) Lectotype major: HW 1.72, HL 2.14, SL 0.78, EL 0.22, PW 0.86.
Paralectotype minor: HW 0.54, HL 0.60, SL 0.56, EL 0.14, PW 0.38.
COLOR Major: concolorous light reddish yellow (light "orange").
Minor: concolorous yellow, with a slight reddish tinge on the head.
RANGE Southern Arizona into Mexico.
BIOLOGY Three colonies were found in a vacant lot in Tucson by Stefan Cover (unpublished field notes), nesting in clayey soil; two had cryptic entrances, and one had a rudimentary crescentic crater of excavated soil. Wheeler's type series were taken from nests in open sandy soil, the entrances of which were also marked by incomplete craters. The species harvests seeds.

FIGURE Upper: major (plus partial frontal head view of a supermajor). Lower: minor. TEXAS: major and minor from Austin (syntypes of the synonymy *kingi* subsp. *instabilis* Emery); supermajor from Guadalajara, Jalisco, Mexico. (Type locality: Tepic, Nayarit, collected by Eisen and Vaslit). Scale bars = 1 mm.

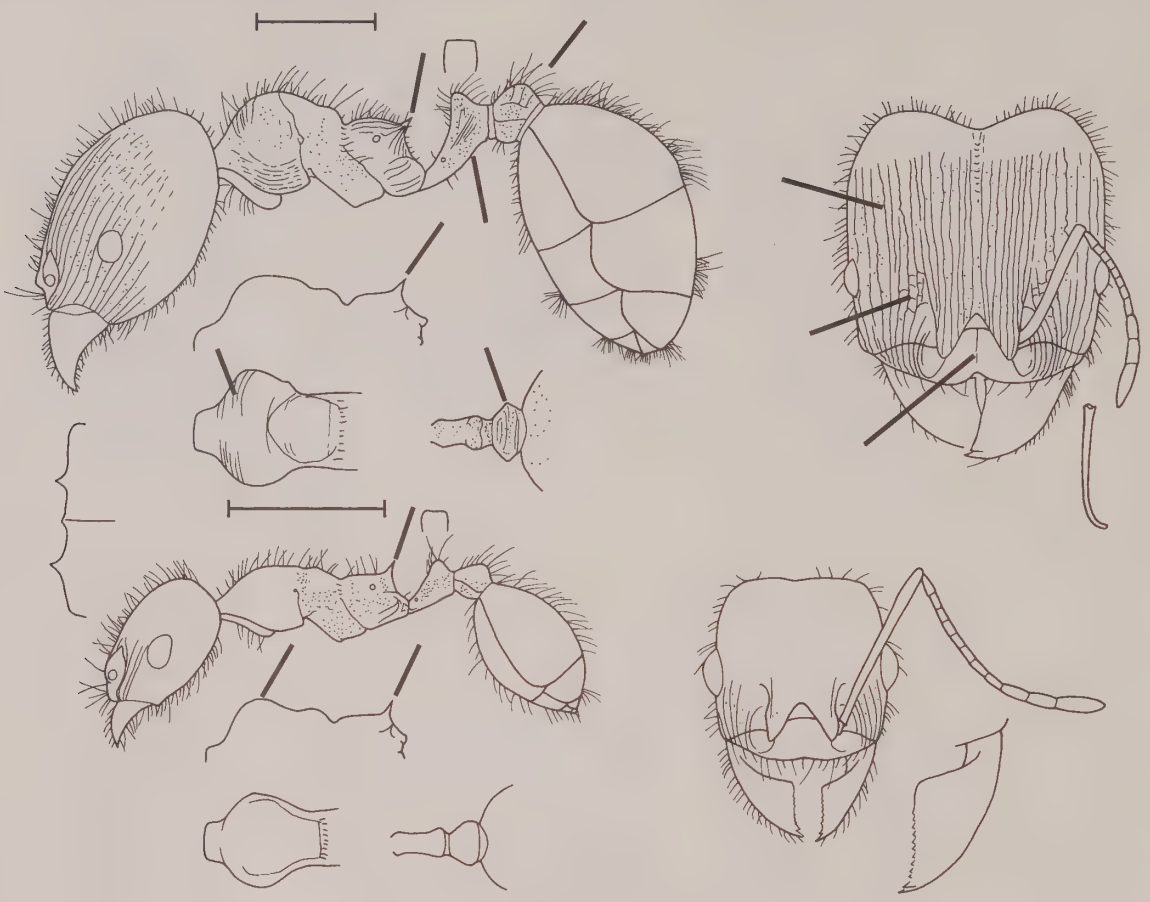


Pheidole tepicana Pergande

Pheidole tepicana Pergande 1896: 878. Syn.: *Pheidole rugifrons* Pergande 1896: 880, synonymy by Emery 1901c: 119; *Pheidole carbonaria* Pergande 1896: 881, synonymy by Emery 1901c: 119; *Pheidole kingi* André 1898: 244, synonymy by Creighton and Gregg 1955: 24; *Pheidole townsendi* André 1898: 246; synonymy by Emery 1922c: 105; *Pheidole kingi* subsp. *instabilis* Emery 1901c: 120, synonymy by Creighton and Gregg 1955: 24; *Pheidole kingi* subsp. *torpescens* Wheeler 1915b: 404, synonymy by Creighton and Gregg 1955: 24. Raised to species level in this monograph: *cavigenis*.

TYPES Amer. Mus. Nat. Hist.; Nat. Mus. Nat. Hist. U. S.
ETYMOLOGY Name based on type locality.
DIAGNOSIS A member of the "*pilifera* complex" of the larger *pilifera* group; for a characterization of the complex, see under *pilifera*. *P. tepicana* is distinguished within the complex as follows. Trimorphic, with major, supermajor, and minor castes.
Major: posterior half of dorsum of head except for occiput smooth and shiny; pronotum low and smoothly convex; mesonotal convexity very low; postpetiole from above diamond-shaped.
Supermajor: posterior third of head covered by a mixture of rugulae and rugoreticula; rugoreticulum present between eye and antennal fossa.
Minor: propodeal spines reduced to denticles; head almost entirely smooth and shiny.
MEASUREMENTS (mm) Major (Austin, Texas): HW 1.12, HL 1.34, SL 0.62, EL 0.12, PW 0.54.
Supermajor (Guadalajara, Mexico): HW 1.62, HL 2.00, SL 0.74, EL 0.14, PW 0.74.
Minor (Austin, Texas): HW 0.52, HL 0.56, SL 0.52, EL 0.12, PW 0.32.
COLOR Major: reddish yellow.
Supermajor: light reddish brown.
Minor: brownish yellow.
RANGE Texas, Arizona southward to at least Jalisco, Mexico: often locally abundant.
BIOLOGY In the Santa Cruz Mountains of Arizona, Stefan Cover (unpublished notes) found a colony of *tepicana* in an open area with opuntia and dwarf acacia surrounded by blue oak, nesting under a stone in the sun; the nest contained a cache of seeds. The species is notably flexible in its choices of nest site. Near Tucson, Arizona, I observed a colony in an open grassy area, spread out beneath multiple stones. In western Texas, Moody and Francke (1982) found numerous colonies, nesting mostly under stones and in open soil; one colony each was also beneath a log, a piece of metal, and a grass clump respectively. And finally, at Cuernavaca, Wheeler (1901b) observed that colonies were common beneath pats of half-dried cow dung.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. TEXAS: Chisos Mts., Brewster Co., southwestern Texas (O. W. Williams). Scale bars = 1 mm.

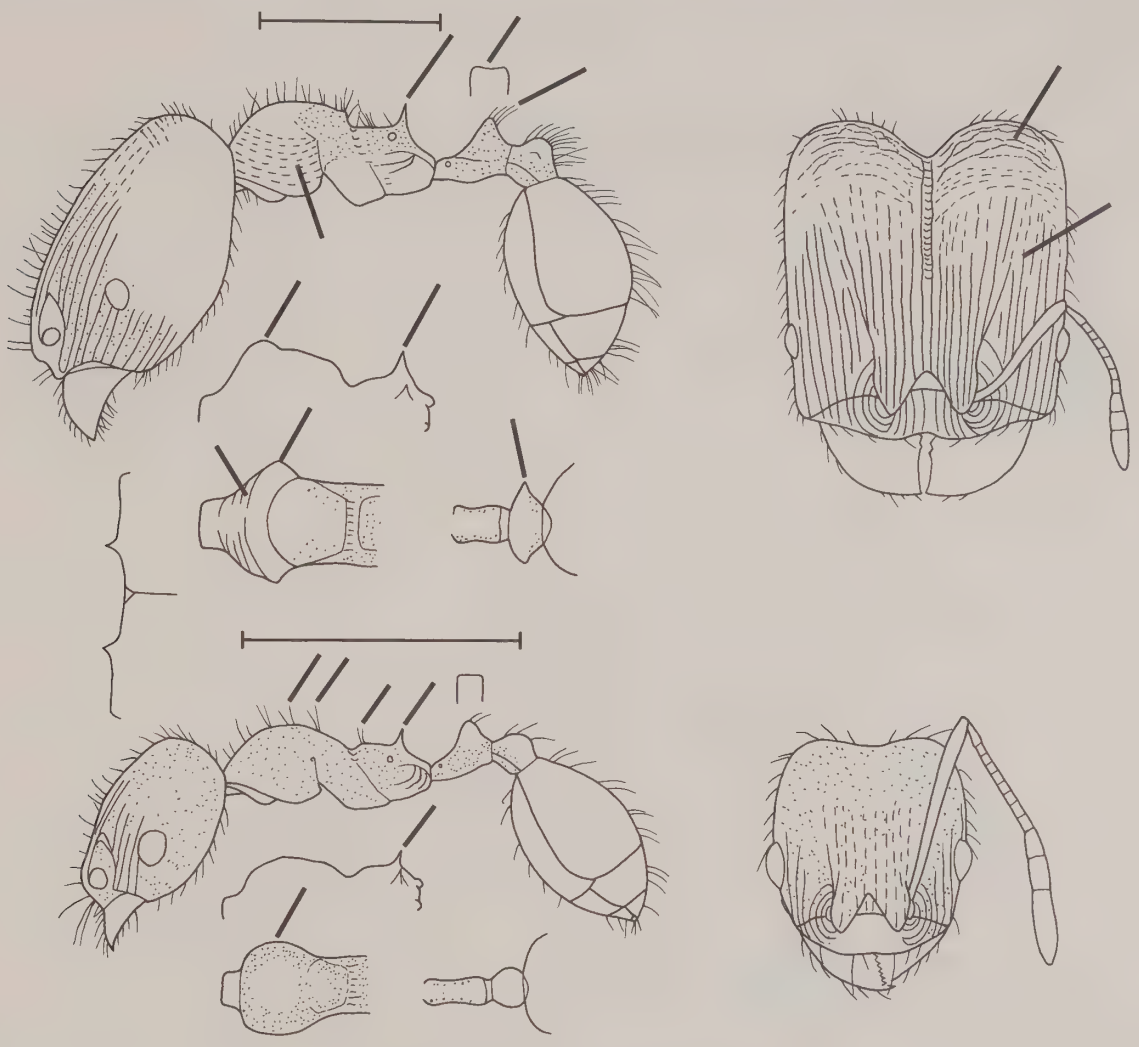


Pheidole titanis Wheeler

Pheidole titanis Wheeler 1903c: 95.

TYPES Mus. Comp. Zool. Harvard; Amer. Mus. Nat. Hist.
ETYMOLOGY Gr *titanis,* of a mythical race of giants.
DIAGNOSIS A large member of the *pilifera* group further characterized by the following traits.
Major: rugoreticular patch just mesad of each frontal carina and posterior to the antennal fossa; the rest of the dorsal surface of the head except for the occiput, central piece of the clypeus, and frontal triangle longitudinally carinulate; median carina present on the clypeus; carinulae cover anterior third and sides of the pronotal dorsum, part of the propodeal dorsum, sides of the petiole, and dorsum of the postpetiolar node; postpetiolar node from above diamond-shaped.
Minor: head subrectangular in full-face view; humerus lobose in dorsal-oblique view; postpetiole bell-shaped from above.
MEASUREMENTS (mm) Lectotype major: HW 1.94, HL 2.02, SL 0.98, EL 0.30, PW 1.10.
Paralectotype minor: HW 0.92, HL 0.94, SL 0.86, EL 0.24, PW 0.60.
COLOR Major and minor: concolorous light reddish brown.
RANGE Western Texas, southern Arizona and Jalisco, Mexico.
BIOLOGY The species occurs in desert scrub and deciduous thorn forest, nesting under stones. As suggested by Creighton and Gregg (1955) and proved by Feener (1988), *titanis* is primarily a specialized predator on termites. In Jalisco, Feener found the species most often attacking foraging columns of *Nasutitermes,* only occasionally scavenging for dead arthropods of other kinds. Scouts recruit nestmates until a raiding force of 200–2000 majors and minors are assembled, encircling the termites, whereupon each ant tries to seize individual prey, then returns to the nest along the chemical recruitment trail. Feener has provided a detailed account of both the raiding behavior of *titanis* and their defensive maneuvers against enemies, especially parasitic phorid flies.

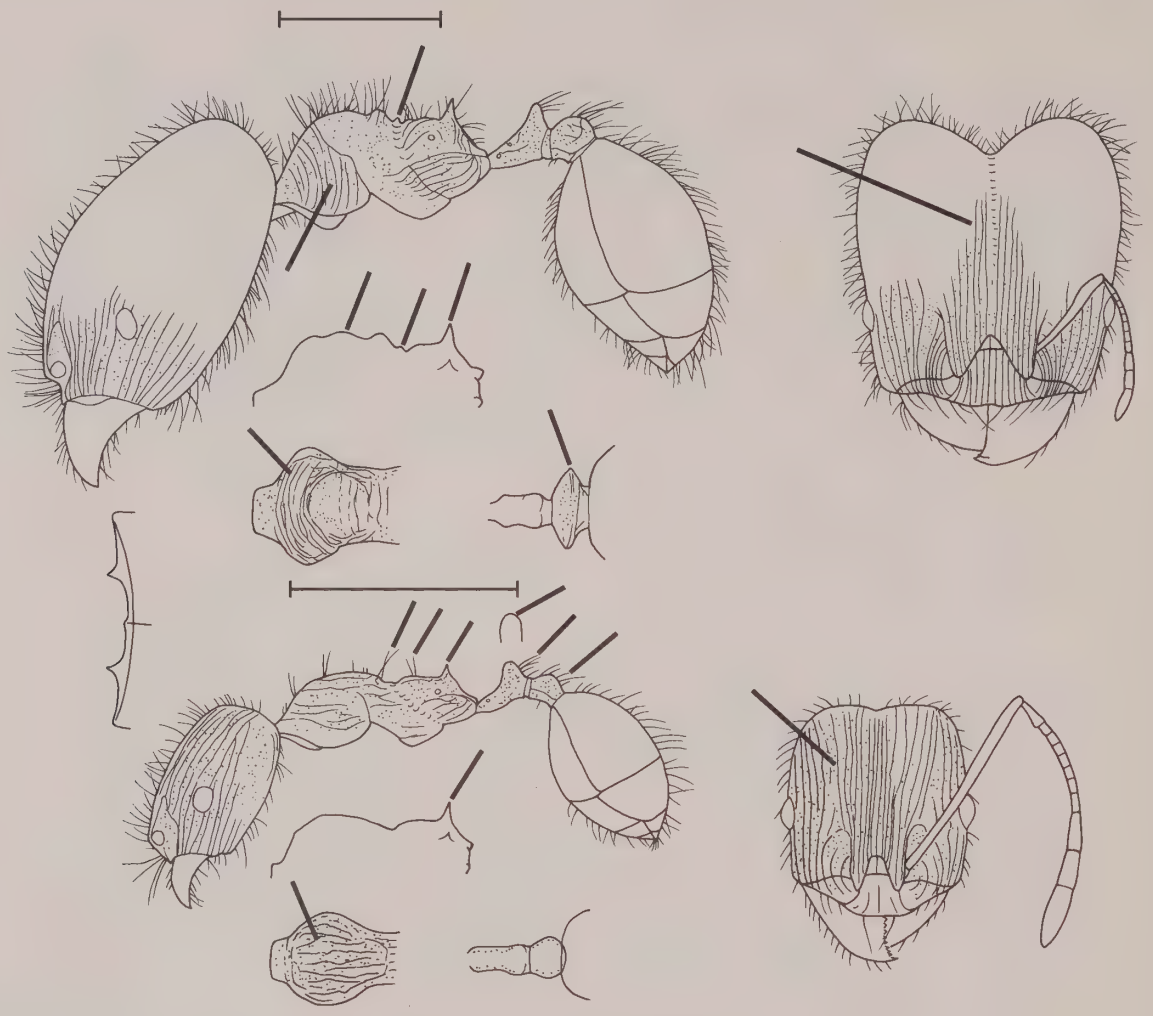
FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: El Sueco, Chihuahua. Scale bars = 1 mm.



Pheidole torosa **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *torosa,* muscular, bulging, a reference to the major caste.
DIAGNOSIS A member of the "*pilifera* complex" of the larger *pilifera* group, comprising *calens, californica, carrolli, cavigenis, clementensis, creightoni, hoplitica, littoralis, micula, pilifera, polymorpha, rugulosa, senex, soritis, tepicana,* and *torosa,* which complex is distinguished by the following traits. Major: dorsal head surface extensively sculptured; occipital lobe transversely rugulose (or, in *carrolli* smooth, in *littoralis* foveate, and in *micula* and *soritis* carinulate); postpetiole from above diamond-shaped, trapezoidal, or spinose. Minor: eye medium-sized to large.
P. torosa is distinguished within the complex as follows.
Major: bicolorous; transverse rugulae cover posterior fifth of dorsal surface of head in full-face view, and longitudinal carinulae cover all of the remainder of the dorsal surface except the frontal triangle; humerus in dorsal-oblique view prominent and lobose; in side view, mesonotum drops almost vertically to metanotum; propodeal spines very long, stout, and vertical to propodeal basal face; seen from above, postpetiole very wide relative to petiole, and spinose.
Minor: all of head and mesosoma foveolate and opaque; pilosity along promesonotal dorsum consists of evenly spaced pairs of setae. This species is very close to and possibly synonymous with *senex*.
MEASUREMENTS (mm) Holotype major: HW 1.56, HL 1.84, SL 0.76, EL 0.20, PW 0.68.
Paratype minor: HW 0.58, HL 0.64, SL 0.62, EL 0.14, PW 0.32.
COLOR Major: bicolorous, with light reddish brown head and appendages contrasting with dark brown mesosoma and gaster.
Minor: concolorous light brown.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ARIZONA: Santa Cruz River, Tucson (W. M. Wheeler). Scale bars = 1 mm.

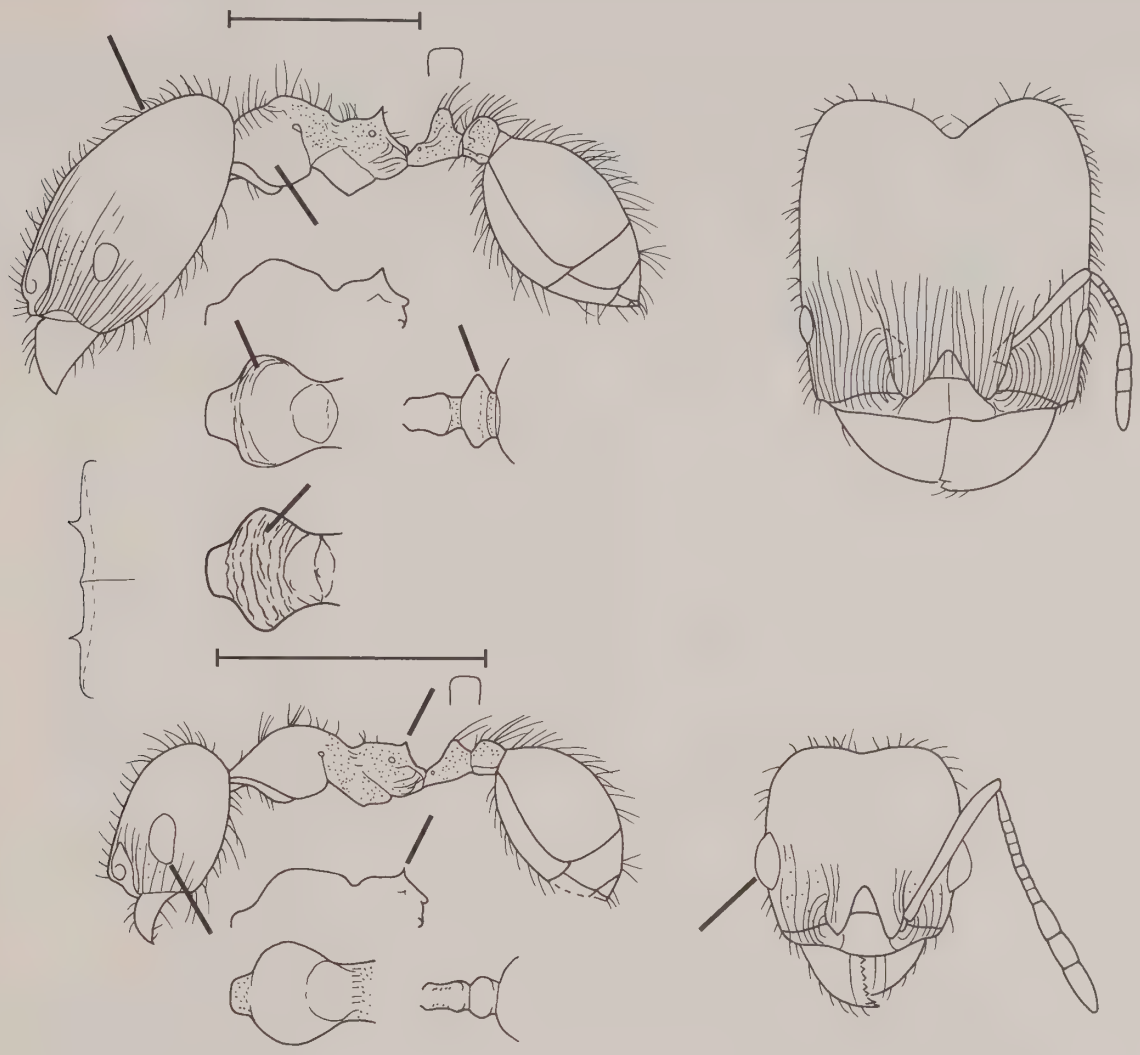


Pheidole virago Wheeler

Pheidole virago Wheeler 1915b: 401.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *virago,* female warrior.
DIAGNOSIS A very large, reddish brown (**major**) to reddish yellow (**minor**) member of the *pilifera* group.
Major: anterior third of head completely carinulate, with some carinulae that originate on the frontal lobes almost reaching the occiput; pronotum and mesonotal convexity completely covered by transverse carinulae; in dorsal-oblique view, promesonotal profile evenly trilobous; a small metanotal convexity present; the propodeal spines large and perpendicular to the basal propodeal face; postpetiole seen from above very broad and conulate.
Minor: dorsal surface of head and sides of mesosoma longitudinally carinulate; pronotal dorsum covered by a mix of longitudinal carinulae and rugulae; propodeal spines perpendicular to basal propodeal face; dorsal margin of petiolar node strongly convex; postpetiolar node depressed.
MEASUREMENTS (mm) Lectotype major: HW 2.02, HL 2.20, SL 0.84, EL 0.20, PW 0.90.
Paralectotype minor: HW 0.60, HL 0.66, SL 0.64, EL 0.12, PW 0.40.
COLOR Major: concolorous light reddish brown.
Minor: reddish yellow.
RANGE Texas to Arizona.
BIOLOGY Extremely rare. Wheeler's type series were from nests in open sandy soil, marked by 1-cm-wide entrances surrounded by craters of sandy soil 8 to 12 cm across. Ingham (1959, 1963; unpublished theses quoted by Allred 1982), reported *virago* at 900 m in southern Utah, in desert and semidesert, variously with creosote bush, bur sage, rabbitbrush, cholla, marigold, and Russian thistle, forming crater nests in open soil. However, the Utah records are doubtful and need field confirmation.

FIGURE Upper: syntype, major. Lower: syntype, minor. TEXAS: Ft. Davis, Jeff Davis Co. Additional major promesonotum: syntype of synonymous *P. xerophila* subsp. *tucsonica* Wheeler (Tucson, Arizona). Scale bars = 1 mm.



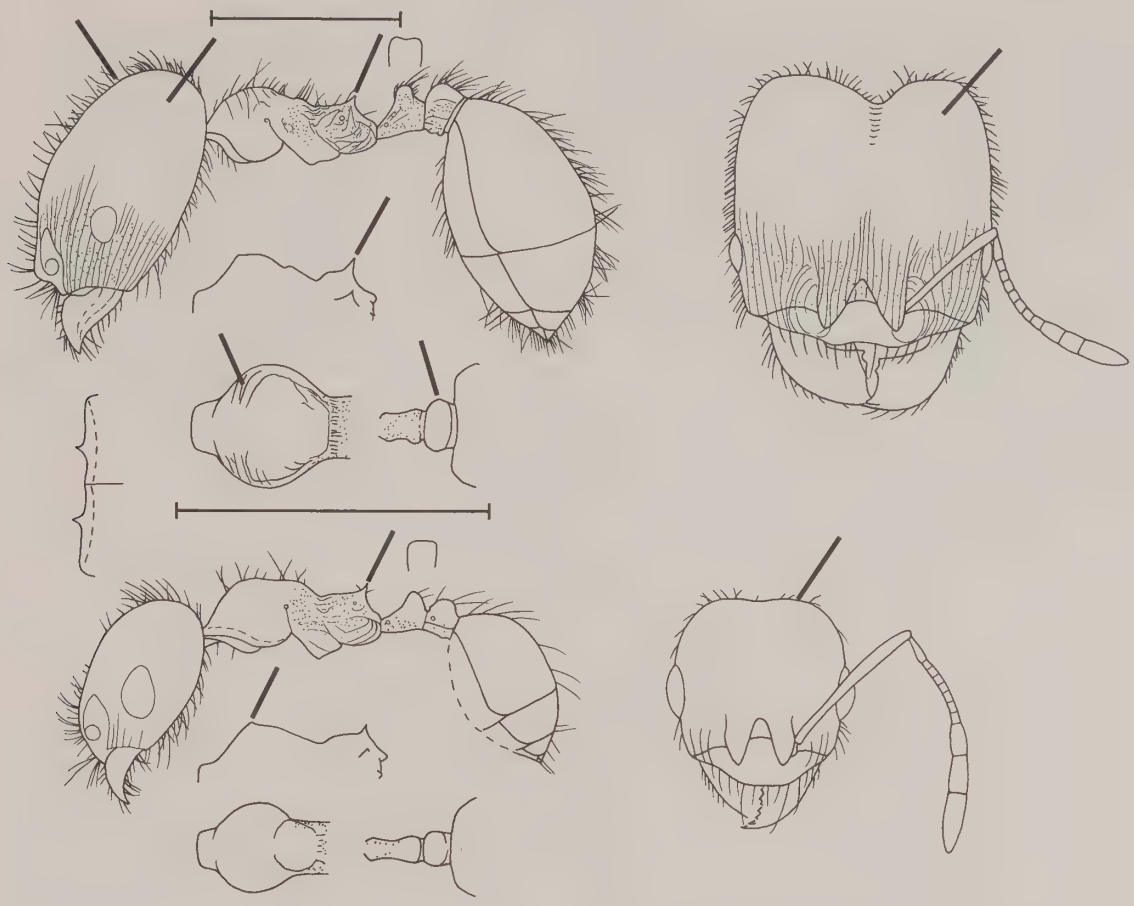
Pheidole xerophila Wheeler

Pheidole xerophila Wheeler 1908h: 446. Syn.: *Pheidole xerophila* subsp. *tucsonica* Wheeler 1908h: 448, synonymy by Creighton and Gregg 1955: 42.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *xerophila,* aridity lover.
DIAGNOSIS A small, large-eyed member of the *pilifera* group, close to *gilvescens* and distinguished as follows.
Major: parts variously reddish yellow to light reddish brown; postpetiolar node transversely conulate, nearly 2× broader than the petiolar node; sides of pronotum mostly free of carinulae, and smooth. With *gilvescens,* also similar to *bajaensis* and *yaqui,* both differing in the **major** by the flattened profile of the dorsal posterior half of the head in side view, and by the head tapering conspicuously from the midline to the occiput in side view. The form "subspecies *tucsonica*" is here treated as a geographic variant with a transversely rugulose pronotal dorsum (as figured above), which as Creighton and Gregg (1955) pointed out, is found from central Texas westward through southern New Mexico and Arizona to the mountains of southern California and southward into Sonora as far as Guayamas. "Typical" *xerophila,* with a mostly smooth pronotal dorsum (see figure above) ranges from the Big Bend of Texas into southwestern New Mexico. Because intermediates in the pronotal sculpturing occur in central Mexico, Creighton and Gregg (1955) treated *tucsonica* as a subspecies of *xerophila*. Snelling and George (1979), although confirming the intergradation, raised *tucsonica* to species level, and this step was followed by G. C. and J. Wheeler (1986g). On the evidence I have kept *tucsonica* as part of *xerophila,* but this is not a firm conclusion; Snelling and George may be right in considering the intermediates as no more than rare hybrids.
MEASUREMENTS (mm) Syntype major: HW 1.28, HL 1.42, SL 0.62, EL 0.20, PW 0.60.
Syntype minor: HW 0.56, HL 0.60, SL 0.52, EL 0.20, PW 0.36.

COLOR Major: head and legs medium reddish yellow; mesosoma and rest of appendages dark reddish yellow, waist and gaster light reddish brown.
Minor: body medium yellowish brown; appendages light yellowish brown.
RANGE Central Texas to southern California and Sonora, Mexico; see further account in Diagnosis above.
BIOLOGY Snelling and George (1979) report that in southern California *xerophila ("tucsonica")* occurs at 150–1500 m, in creosote bush scrub and Joshua-tree and oak-juniper woodland. The colonies contain 30-40 majors and 300-400 minors and build small, low craters in the sand, often surrounded by seed chaff. Caches of seed are present. Similarly, G. C. and J. Wheeler (1986g) found the species ("subspecies *tucsonica*") locally abundant in southernmost Nevada, where it forms crater nests in fine sand, sometimes ringed by seed chaff; the nest chambers also contained insect fragments. In western Texas, Moody and Francke (1982), found the species relatively common between 600 and 1800 m, nesting mostly in open soil but occasionally beneath stones. In the Chihuahuan and Sonoran deserts of southern Arizona and New Mexico Stefan Cover (personal communication) found it one of the commonest *Pheidole,* occurring with *hyatti, rugulosa,* and *soritis*. It harvests seeds along trunk trails, with the large majors often accompanying the minors.

FIGURE Upper: paratype, major. Lower: paratype, minor. CALIFORNIA: Yaqui Well, Anza Desert State Park (W. S. Creighton). Scale bars = 1 mm.

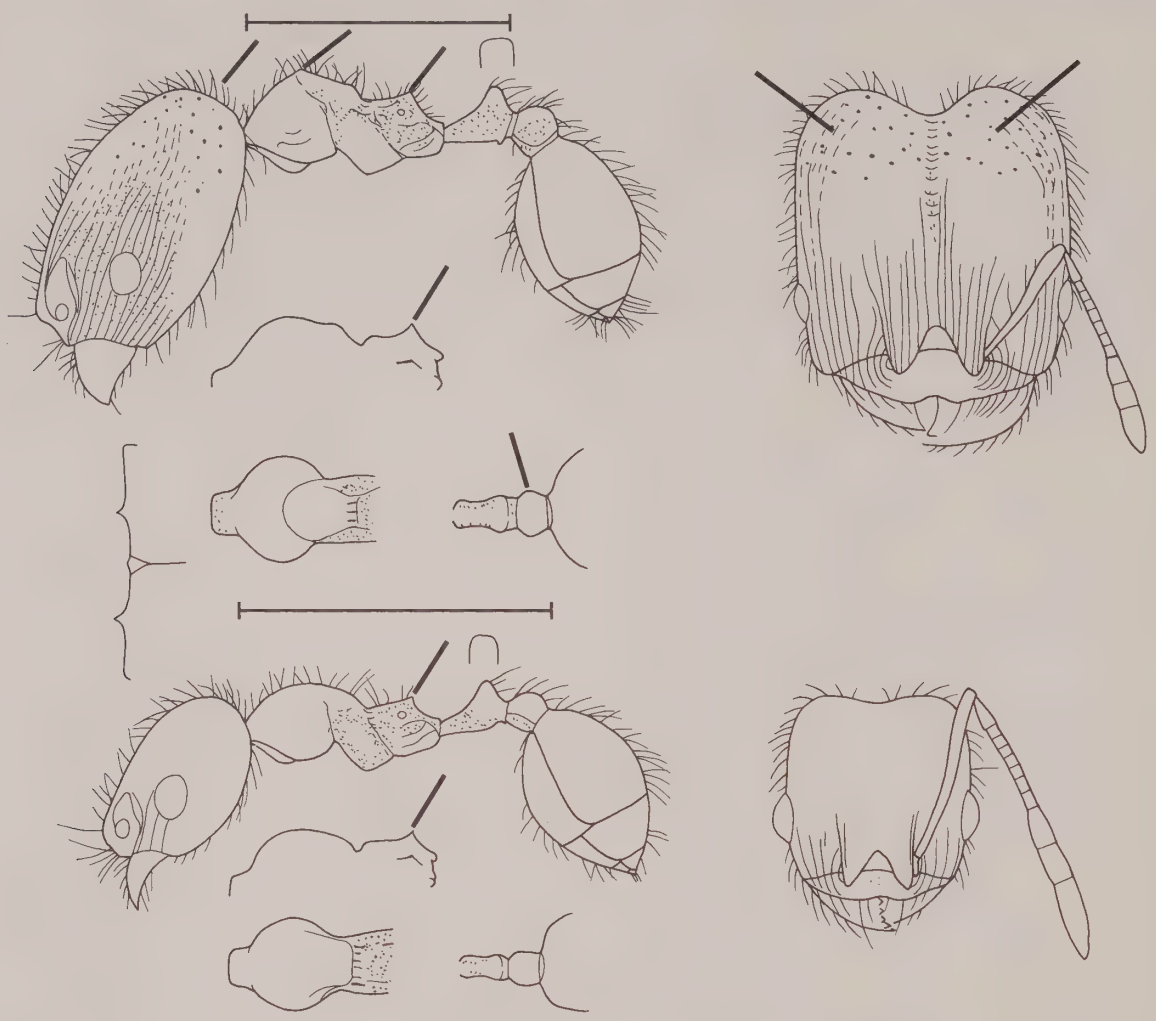


Pheidole yaqui Creighton and Gregg

Pheidole yaqui Creighton and Gregg 1955: 43.

TYPES Nat. Mus. Nat. Hist. U. S.
ETYMOLOGY Named after either the type locality or the Yaqui people of the Sonoran desert.
DIAGNOSIS Close to and possibly a senior synonym of *bajaensis,* differing as follows.
Major: occiput smooth, not rugulose; postpetiole seen from above ovoid, not literally angulate; margins of pronotal dorsum transversely carinulate.
Minor: humerus in dorsal-oblique view subangulate; occiput narrow, its corners less angulate than in *bajaensis*.
Together, *yaqui* and *bajaensis* differ from *gilvescens* and *xerophila* in the **major's** head shape, which is rounded (not flattened) in the dorsal profile of its posterior half, and in the failure of the head to taper toward the occiput; other traits exist in the **major** and **minor** as depicted.
MEASUREMENTS (mm) Paratype major: HW 1.20, HL 1.30, SL 0.62, EL 0.20, PW 0.52.
Paratype minor: HW 0.50, HL 0.54, SL 0.44, EL 0.16, PW 0.32.
COLOR Major: brownish yellow.
Minor: body and appendages medium yellow except for dorsal surface of head, which is a slightly contrasting shade of light yellowish brown.
RANGE Known from southern California (100–1050 m) and Baja California (northern half of the peninsula), sea level to 550 m.
BIOLOGY The unpublished records of Stefan Cover show that *yaqui* occurs in southern California from desert at lower elevation to creosote-acacia-juniper scrub in the uplands. The colonies of 50 to 100 workers nest in arid soil, sometimes with a crater of excavated earth and seed chaff. At Deep Canyon, near Palm Springs, California, Wheeler and Wheeler (1973e) found *yaqui* in desert and in palo verde and agave-ocotillo scrub, in crater soil nests; they uncovered caches of *Euphorbia micromera* and *Oenothera clavaeformis* seeds inside the nests.

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: 11 km south of Progreso (E. O. Wilson). Scale bars = 1 mm.



Pheidole yucatana **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *yucatana,* from the Mexican region of the type locality.

DIAGNOSIS A member of the "*bicarinata* complex" of the larger *pilifera* group, comprising *agricola, aurea, barbata, bicarinata, centeotl, cerebrosior, defecta, gilvescens, macclendoni, macrops, marcidula, paiute, pinealis, xerophila, yaqui,* and *yucatana,* which complex is characterized by the large to very large, forward-set eyes in both castes; and, in the major, the occipital lobes lacking any sculpturing (except in *aurea*); the posterior half of the head capsule almost entirely smooth and shiny; and the postpetiolar node seen from above oval, elliptical, or laterally subangular (cornulate in *cerebrosior*).

P. yucatana is distinguished by the following combination of traits.

Major: in side view, promesonotal juncture subangulate; propodeal spines reduced to right angles; occiput sprinkled with sparse but coarse foveae; faint carinulae extend from behind eye to occipital corners; postpetiolar node from above laterally subangulate.

Minor: in side view propodeal spines reduced to right angles.

MEASUREMENTS (mm) Holotype major: HW 1.04, HL 1.20, SL 0.58, EL 0.10, PW 0.48.

Paratype minor: HW 0.52, HL 0.60, SL 0.54, EL 0.14, PW 0.32.

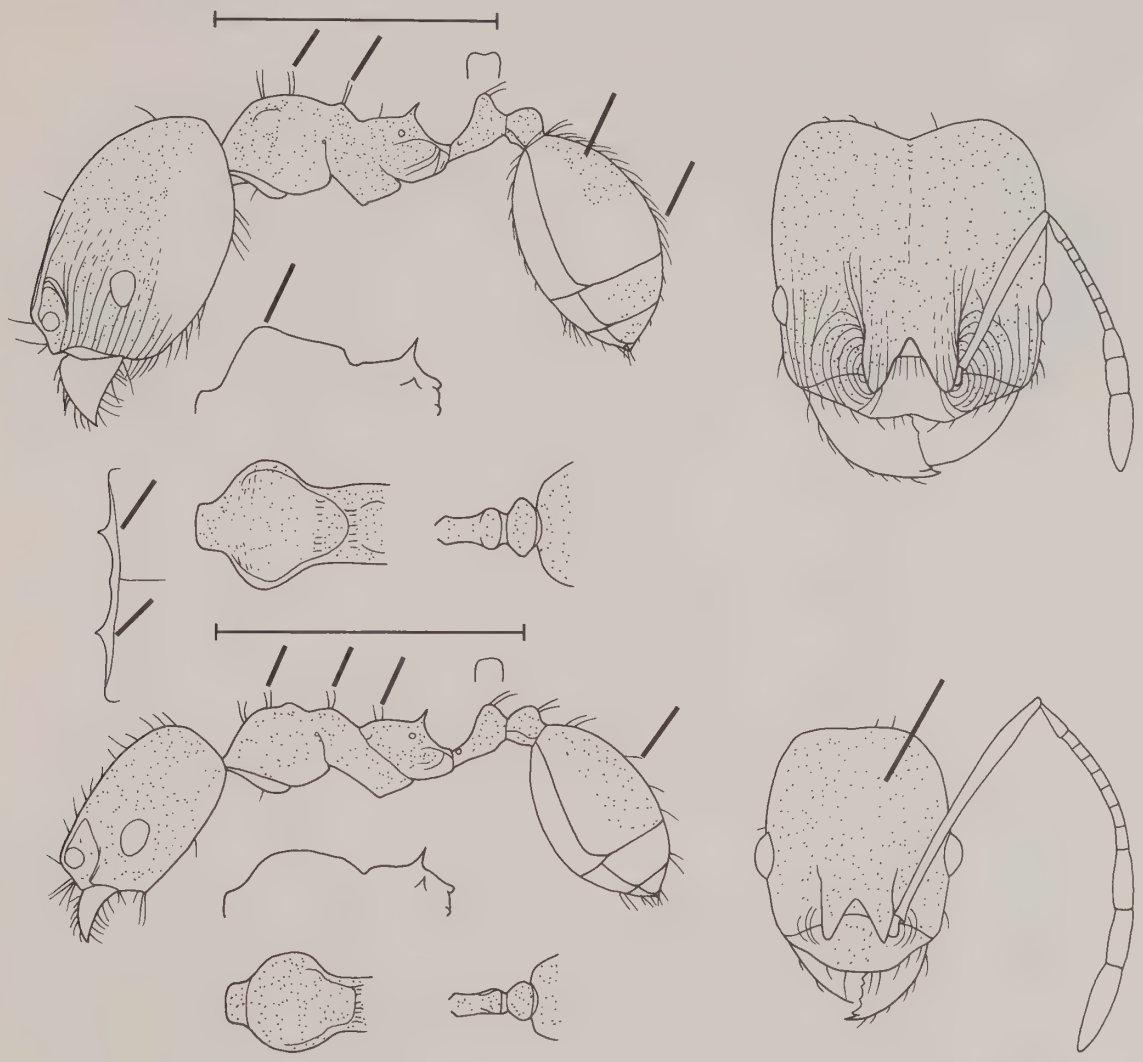
COLOR Major: body medium reddish brown, appendages light reddish brown.

Minor: body light plain brown, tarsi and tibiae yellow, rest of appendages brownish yellow.

RANGE Known only from the type locality.

BIOLOGY From a nest in dry soil at roadside. A winged queen was present in the nest on 25 July.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Isla San José, Islas Murciellagos, Santa Rosa National Park, Guanacaste (David Olson). Scale bars = 1 mm.

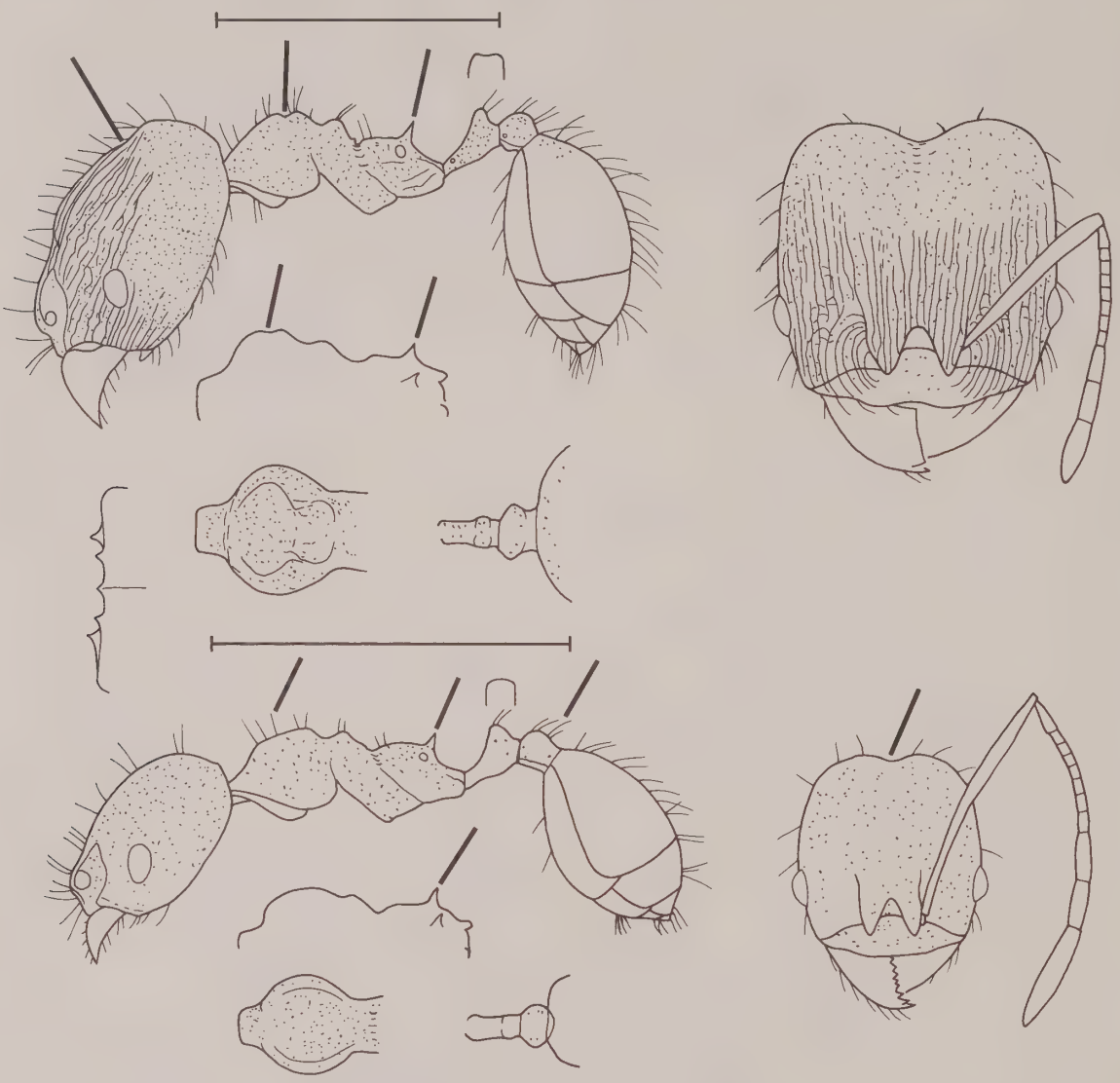


Pheidole angusticeps **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *angusticeps,* narrow-headed, with reference to the minor.
DIAGNOSIS A member of the *punctatissima* group uniquely characterized by the elongate head of the **minor**; and by the bidentate hypostoma and dense, short, uniform, and subappressed gastral pilosity of the **major**. See also the sparse, paired mesosomal pilosity of the mesosoma in both **major** and **minor**.
MEASUREMENTS (mm) Holotype major: HW 0.98, HL 1.08, SL 0.64, EL 0.18, PW 0.50.
Paratype minor: HW 0.46, HL 0.60, SL 0.66, EL 0.14, PW 0.34.
COLOR Major: yellow with faint reddish tint ("light orange").
Minor: concolorous medium yellow.
RANGE I have seen three nest series, all from Guanacaste Province, Costa Rica.
BIOLOGY Unknown.

Compare with members
of the *punctatissima* group

FIGURE Upper: holotype, major. Lower: paratype, minor. TRINIDAD: Aripo Ridge, Arima Valley, 600–700 m (Stefan Cover and Mark W. Moffett). Scale bars = 1 mm.

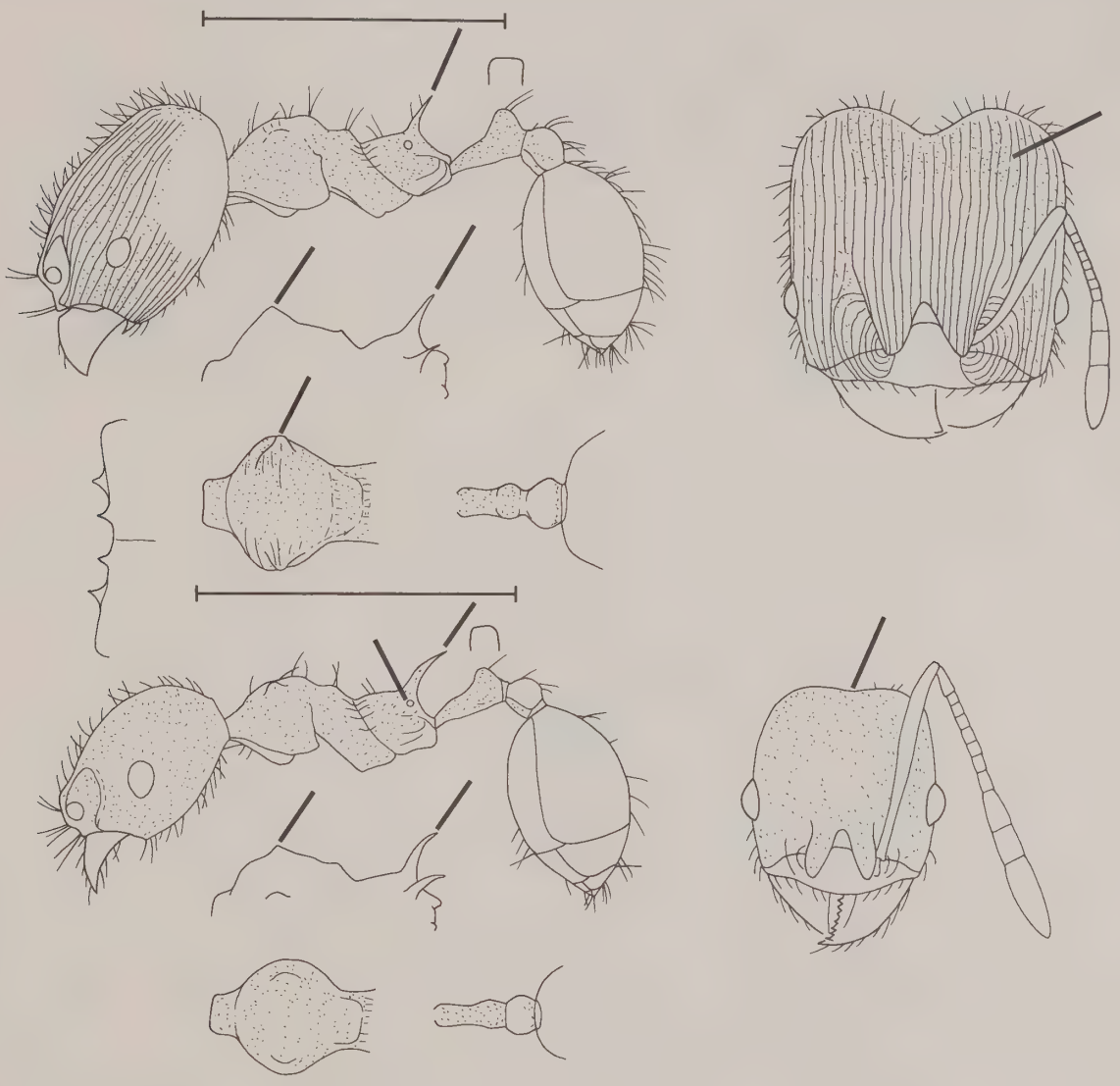


Pheidole aripoensis **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named in reference to the type locality.
DIAGNOSIS Recognizable within the *punctatissima* group by the uniquely concave posterior dorsal profile of the **major's** head, combined with the double convexity of the **major's** pronotum (hence triple convexity of the promesonotum), concave occipital border of the **minor**, and well-developed propodeal spines, relatively sparse pilosity, and yellow color of both castes. Other traits in body form and sculpturing are illustrated.
MEASUREMENTS (mm) Holotype major: HW 0.92, HL 0.92, SL 0.64, EL 0.14, PW 0.42.
Paratype minor: HW 0.44, HL 0.50, SL 0.60, EL 0.10, PW 0.26.
COLOR Major: yellow, with head and mesosoma possessing a slightly dark, "orange" tinge.
Minor: concolorous yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with members
of the *punctatissima* group

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Mun. Buenaventura, 3.2 km above Rio Aguaclara on the old Cali road, Valle (William L. Brown). Scale bars = 1 mm.



Pheidole cataphracta **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *cataphracta,* fully armored.

DIAGNOSIS A member of the *punctatissima* group easiliy recognized by the very long propodeal spines, which are about as long as the basal face of the propodeum anterior to them.

Major: dorsum of head completely carinulate except for frontal triangle and mid-clypeus; humerus subangulate; all of mesosoma and petiole foveolate and opaque.

Minor: almost all of head, as well as all of mesosoma and petiole, foveolate and opaque; humerus with protuberant blunt oblique angles.

MEASUREMENTS (mm) Holotype major: HW 0.94, HL 0.96, SL 0.54, EL 0.14, PW 0.46.
Paratype minor: HW 0.46, HL 0.50, SL 0.50, EL 0.10, PW 0.32.

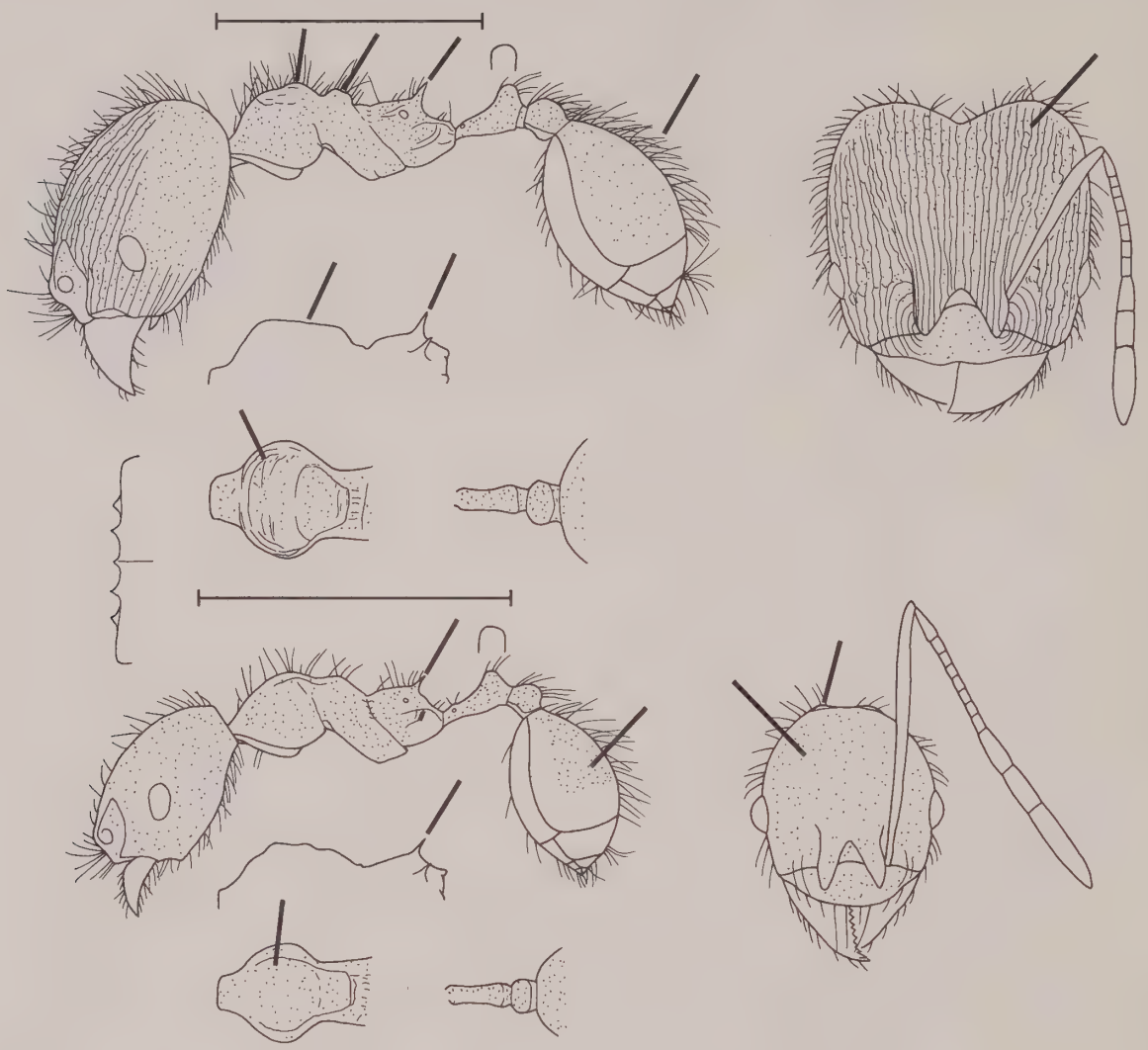
COLOR Major: concolorous yellow except for head, which is dark yellow with a slight reddish tinge.
Minor: concolorous medium yellow.

RANGE Recorded from only two collections in Valle Department, Colombia.

BIOLOGY Unknown.

Compare with members
of the *puncatatissima* group

FIGURE Upper: holotype, major. Lower: paratype, minor. PANAMA: Barro Colorado Island (William L. Brown). Scale bars = 1 mm.



Pheidole dasypyx **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *dasypyx,* hairy rump, referring to the dense pilosity of the gaster.

DIAGNOSIS **Major**: distinguished within the *punctatissima* group by the combination of the 3-lobed promesonotal profile in side view, with the mesonotal (rearmost) convexity flat-topped; long, robust propodeal spine; completely rugulose posterior half of the head, reaching all the way to the occiput; completely foveolate and opaque first gastral tergite; and dense pilosity.
Minor: head, mesosoma, and waist entirely foveolate and opaque; occiput narrow, with a very thin nuchal collar.
Both castes are yellow.

MEASUREMENTS (mm) Holotype major: HW 0.96, HL 0.94, SL 0.66, EL 0.16, PW 0.40.
Paratype minor: HW 0.46, HL 0.54, SL 0.68, EL 0.10, PW 0.32.

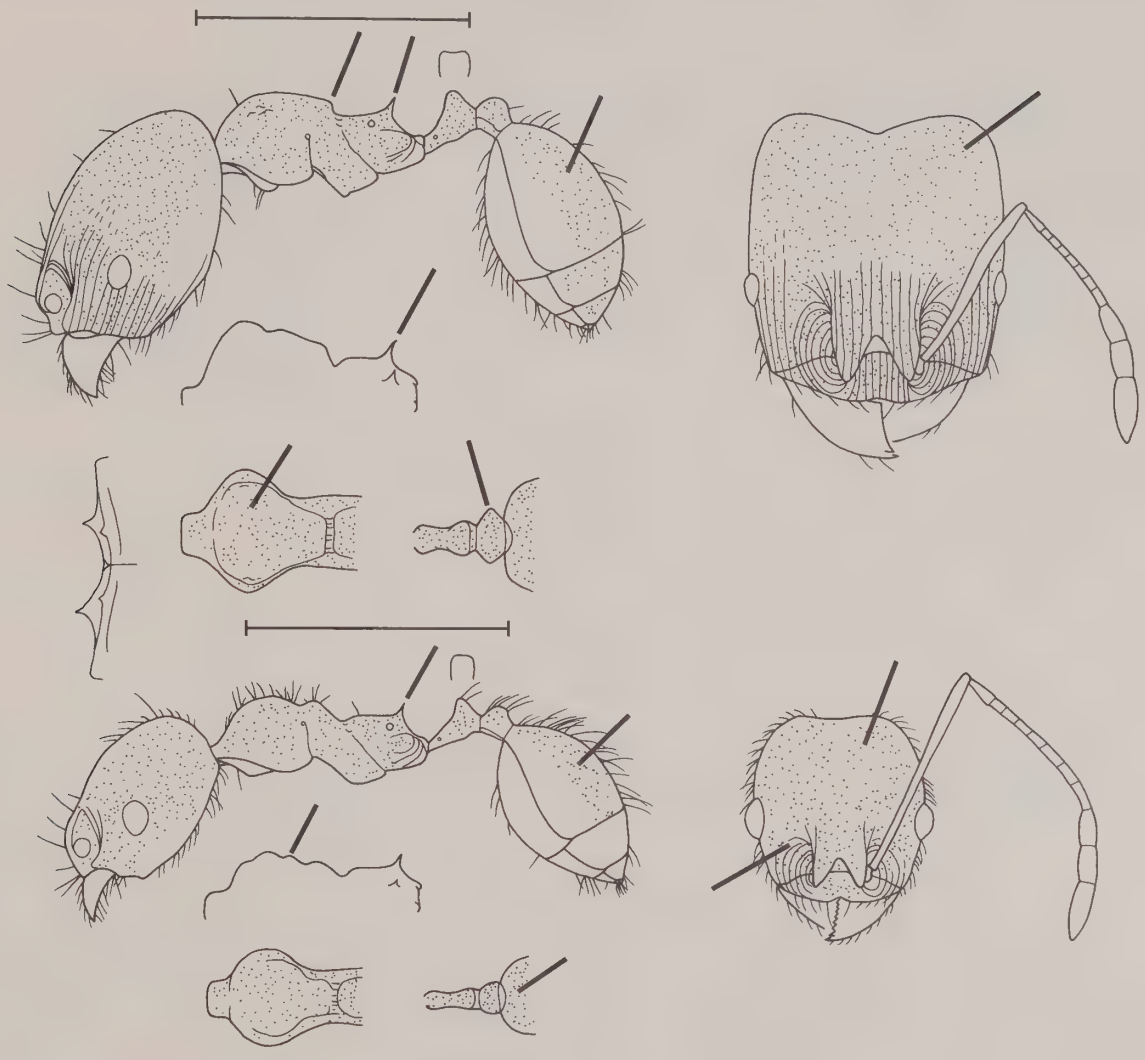
COLOR Major and minor: concolorous medium yellow.

RANGE Known only from Barro Colorado Island, Panama.

BIOLOGY Unknown.

Compare with members
of the *punctatissima* group

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: 1 km east of station, Santa Rosa National Park, 280 m (David Olson). Scale bars = 1 mm.



Pheidole gradifer **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *gradifer,* step-bearing, with reference to the step-like posterior descent.

DIAGNOSIS Unique within the *punctatissima* group in the absence of a mesonotal convexity in the **major** and the manner in which the promesonotum descends almost vertically in side view to the metanotum. In addition, the **major** has almost no pilosity on the mesosoma or waist; carinulae are present only on the anterior half of the dorsal head surface, but the entire rest of the head, mesosoma, waist, and gastral tergites are foveolate and opaque.

Minor: mesosoma trilobous in dorsal-oblique view; carinulae limited to anterior third of dorsal head surface, but all of head, mesosoma, waist, and central strip of first gastral tergite are foveolate and opaque.

MEASUREMENTS (mm) Holotype major: HW 0.92, HL 1.00, SL 0.64, EL 0.16, PW 0.50.
Paratype minor: HW 0.60, HL 0.64, SL 0.78, EL 0.14, PW 0.38.

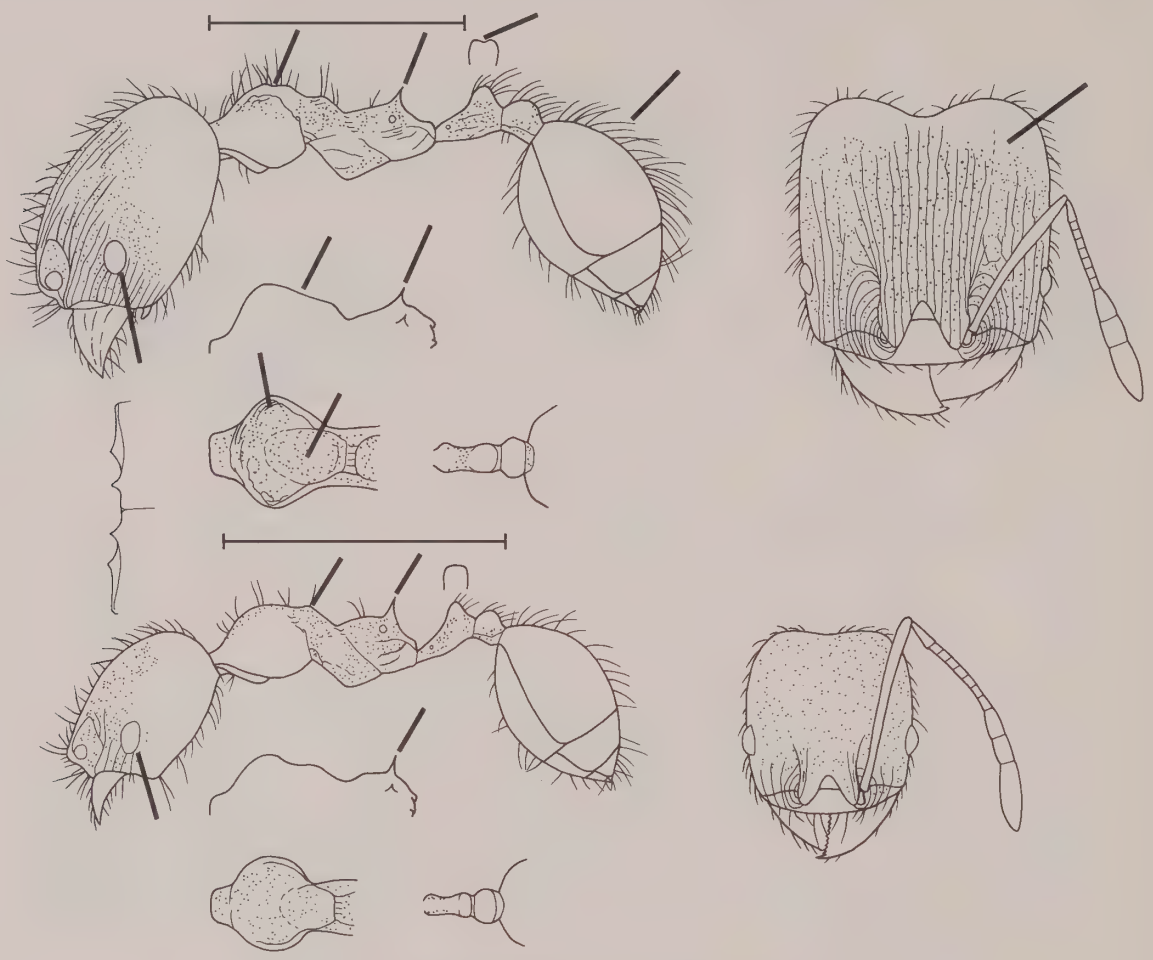
COLOR Major: concolorous light reddish yellow ("orange").
Minor: dark yellow.

RANGE Known only from the type locality.

BIOLOGY The type series was collected in tropical dry forest (David Olson).

Compare with members
of the *punctatissima* group

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Monteverde, Puntarenas, 1550 m (Philip S. Ward). Scale bars = 1 mm.



Pheidole humida **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *humida,* moist, damp, referring to the habitat of the type series.

DIAGNOSIS A member of the *punctatissima* group distinguished by the forward placement of the eye, which in the **major** is as close to the genal margin as its own length and in the **minor** approaches the genal margin to within half its length. Both castes have long, thin propodeal spines, and completely smooth and shiny gasters, occiputs, and sides of the pronotum. The **major** has rugulae along the front and lateral margins of the pronotal dorsum, and long, dense pilosity on the gaster. Both castes are yellow.

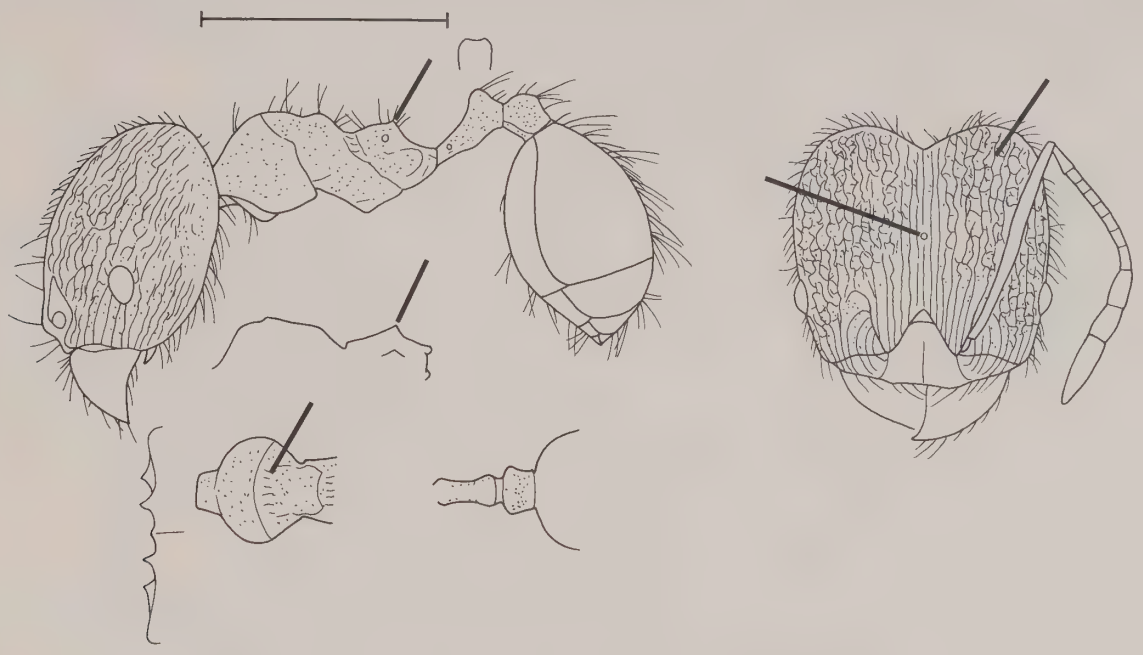
MEASUREMENTS (mm) Holotype major: HW 0.92, HL 0.94, SL 0.60, EL 0.14, PW 0.46.
Paratype minor: HW 0.52, HL 0.54, SL 0.54, EL 0.14, PW 0.34.

COLOR Major: head and mandibles light reddish yellow, rest of body and appendages medium yellow.
Minor: concolorous medium yellow.

RANGE Known only from the type locality.

BIOLOGY Collected in a rotten log in montane rainforest (P. S. Ward).

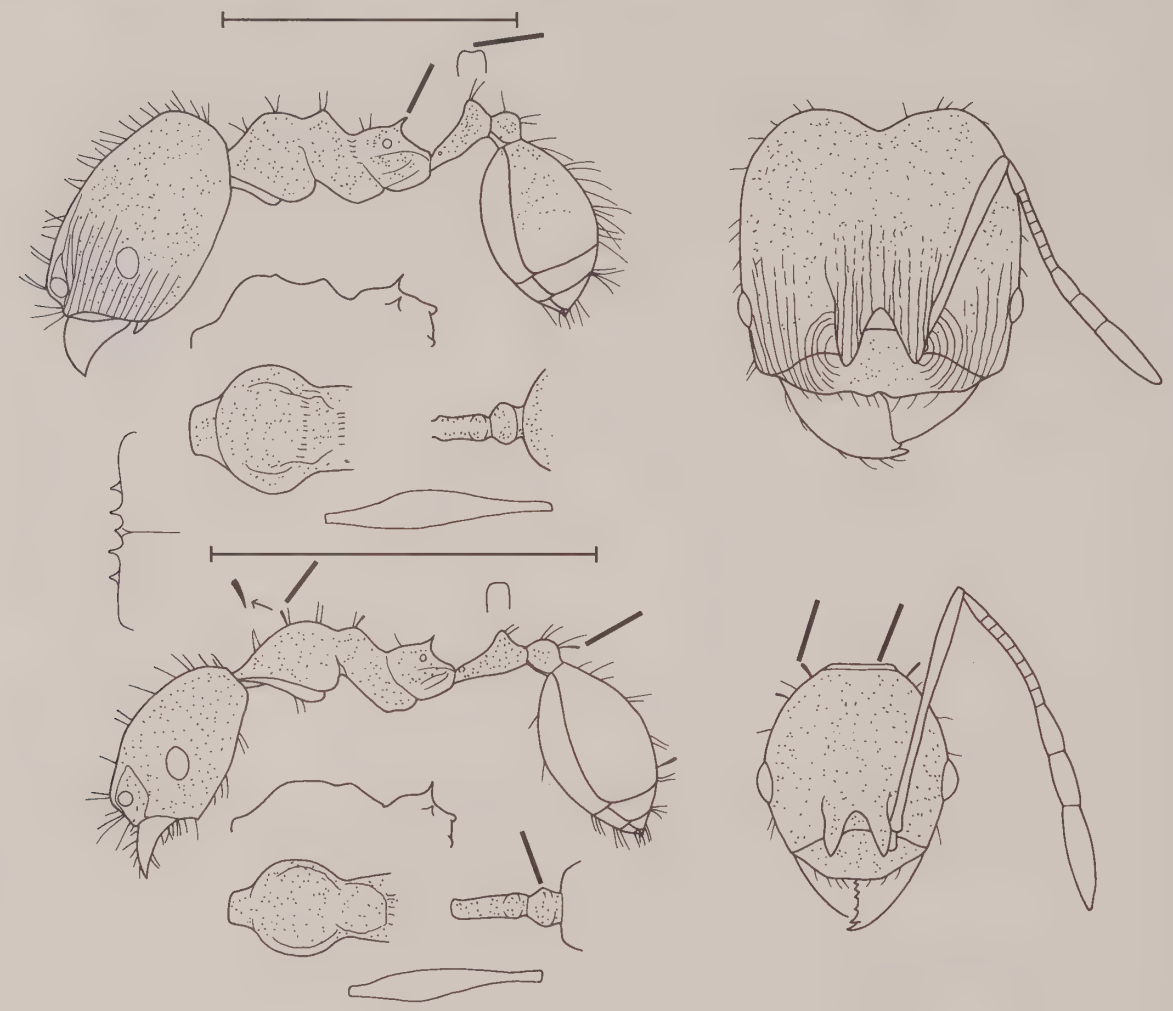
FIGURE Holotype, major. PERU: Machu Picchu, 2000–2200 m (William L. Brown). Scale bar = 1 mm.



Pheidole inca **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the Inca, in whose ancient city Machu Picchu the species was discovered.
DIAGNOSIS **Major**: uniquely distinguished within the *punctatissima* group by the sculpturing of the dorsal surface of the head, which consists of longitudinal carinulae along the midline flanked on either side by rugoreticula, all reaching the occipital border, combined with the presence of a median ocellus, propodeal spine reduced to a right angle, and brown body color.
Minor: unknown.
MEASUREMENTS (mm) Holotype major: HW 0.94, HL 0.96, SL 0.74, EL 0.18, PW 0.46.
COLOR Major: head, antennae, and gaster medium brown, mesosoma and waist light brown, legs dark yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: major (syntype of synonymous *mimula*); right hind femur depicted at bottom. Lower: minor (syntype of synonymous *mimula*). GUYANA: Tukeit. (Type locality: La Moka, Venezuela; F. Meinert.) Scale bars = 1 mm.

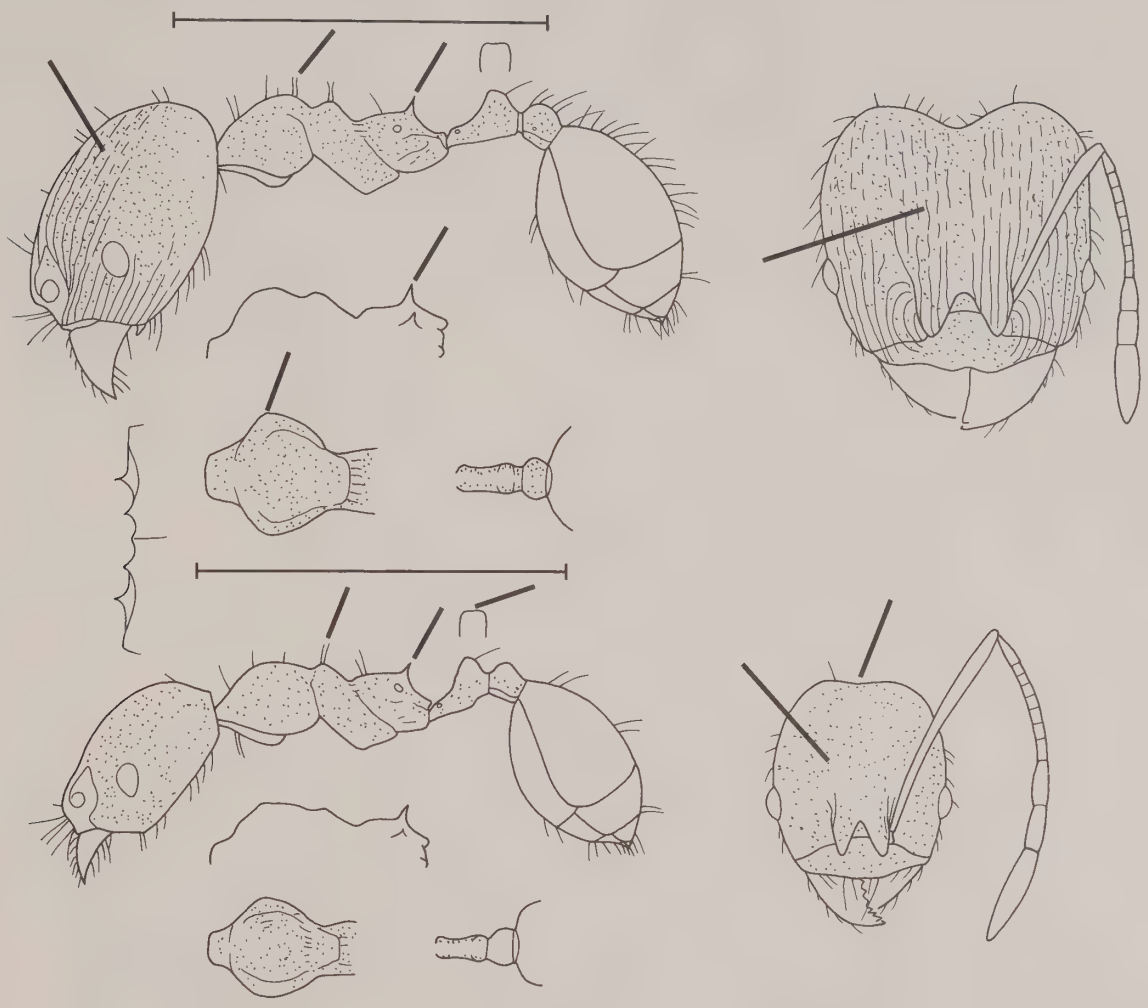


Pheidole meinerti Forel

Pheidole meinerti Forel 1905e: 159. Syn.: *Pheidole mimula* Wheeler 1916c: 5, n. syn.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY Named after the collector F. Meinert.
DIAGNOSIS **Major**: pilosity of mesosomal dorsum sparse, comprising four or so pairs of short erect hairs; entire head, mesosoma, waist foveolate and opaque; other sculpturing limited to longitudinal carinulae on anterior half of head; anterior fifth of median strip of first gastric tergite shagreened, and remainder of gaster smooth and shiny.
Minor: pilosity of dorsa of mesosoma and waist sparse, consisting of a small number of short, erect pairs of setae, some of which are clavate; some hairs on rear third of head also clavate; occiput narrow, with thin nuchal collar.
MEASUREMENTS (mm) Holotype of *meinerti* major: HW 0.78, HL 0.78, SL 0.56, EL 0.10, PW 0.36.
Minor (Cuzco Amazónico, near Puerto Maldonado, Peru): HW 0.42, HL 0.48, SL 0.56, EL 0.08, PW 0.26.
COLOR Major and minor: concolorous yellow.
RANGE Known from single records each from Venezuela, Guyana, and Amazonian Brazil, Peru, and Ecuador.
BIOLOGY At Cuzco Amazónico, near Maldonado, Peru, Stefan Cover and John Tobin found *meinerti* in mature terra firme forest and forest transitional between terra firme and seasonally flooded forest. The species appears to be adapted to unstable nest sites on the ground. Two of the colonies were between dead leaves in the leaf litter, and one was in a rotten stick on the surface of the litter. Colonies were small, consisting of 100 workers or less, and a single queen. Cover (personal communication) notes that both majors and minors have long legs and antennae, move very rapidly, and are not aggressive when the nests are disturbed. In this respect they resemble *auriger, aripoensis, cataractae,* and *demeter*. Possibly these are traits that represent a guild of opportunistic, frequently emigrating ground nesters.

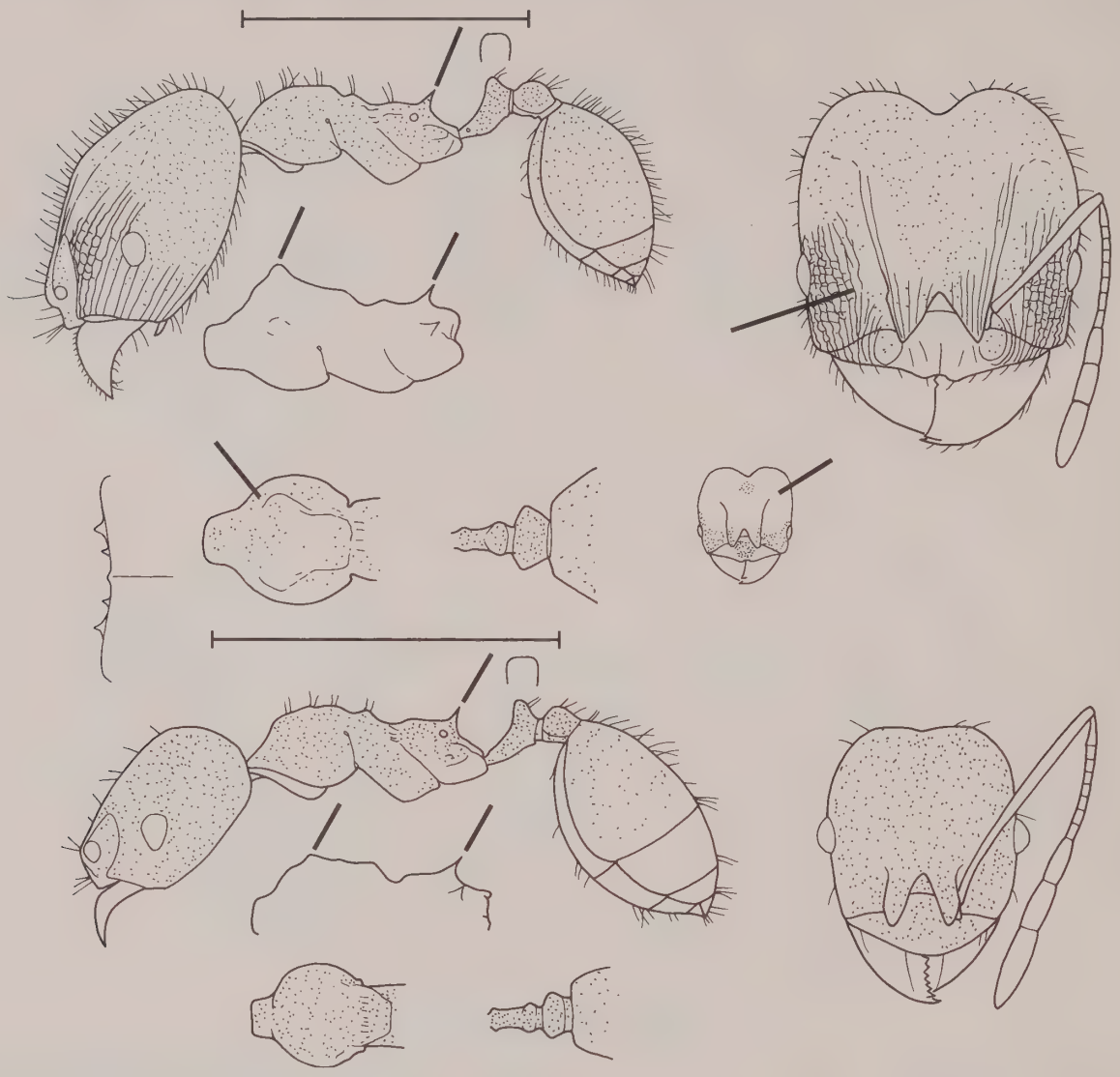
FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Transecto Sumapaz, Meta, 920 m (T. van der Hammen). Scale bars = 1 mm.



Pheidole metana **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the department of Colombia from which the type series originated.
DIAGNOSIS Major and minor: pilosity of mesosomal dorsum short, erect, and consisting mostly of pairs (see also *angusticeps* and *meinerti*).
Major: dorsum of head covered to occipital margin by longitudinal carinulae, which are faint and broken in the posterior half; rest of sculpturing consists solely of foveolation, covering all of the body except the gaster, which is entirely smooth and shiny.
Minor: all of head and mesosoma foveolate and opaque; sculpturing otherwise entirely absent except for carinulae on margins of the frontal lobes; head narrowed posteriorly, but nuchal collar absent.
MEASUREMENTS (mm) Holotype major: HW 0.80, HL 0.80, SL 0.60, EL 0.12, PW 0.40.
Paratype minor: HW 0.44, HL 0.52, SL 0.60, EL 0.08, PW 0.28.
COLOR Major and minor: concolorous medium yellow.
RANGE Known from the type locality and from the Bogotá-Villavicencio Road, Cundinamarca, 1100 m (Charles Kugler).
BIOLOGY Winged queens were found in the Bogotá-Villavicencio series on 1 May.

FIGURE Upper: major. Lower: minor. MEXICO: Pueblo Nuevo, near Tetzonapa, Veracruz (E. O. Wilson). (Type locality: Mexico; Edward Norton.) Scale bars = 1 mm.



Pheidole punctatissima Mayr

Pheidole punctatissima Mayr 1870a: 400. Syn.: *Pheidole punctatissima* subsp. *napaea* Wheeler 1934g: 165, synonomy by Brown 1981: 525.

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *punctatissima,* very dotted with punctures, probably referring to the nearly complete foveolate sculpturing of the body.

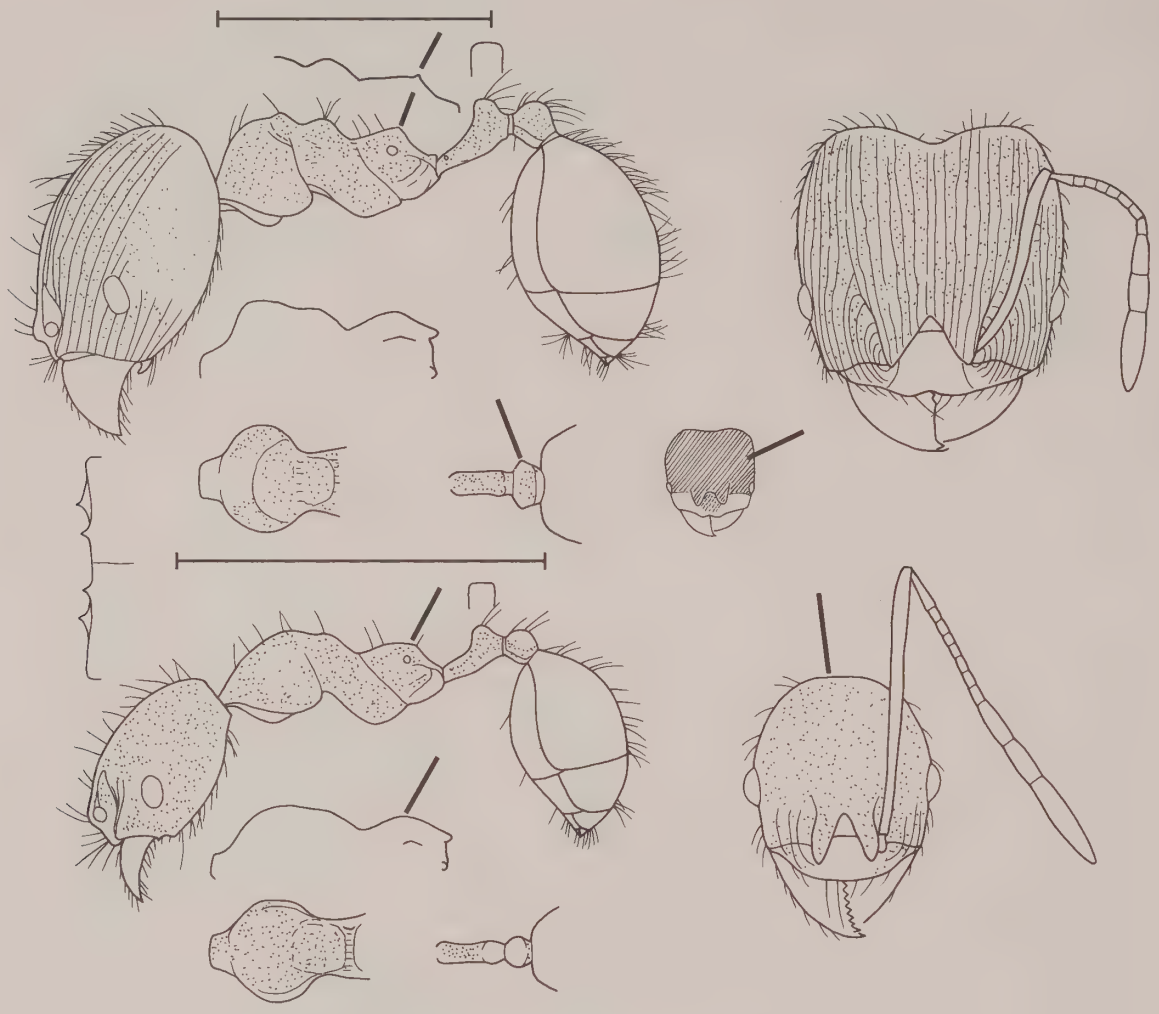
DIAGNOSIS One of the most instantly recognizable of all *Pheidole* species: the **major** has a yellowish white posterior two-thirds of the head capsule (fading to pale yellow in older specimens) that contrasts sharply with the medium to dark brown remainder of the body; the **major** also is distinguished within the *punctatissima* group by the large area of rugoreticulation mesad to the eyes (see also *inca*) and the very prominent cornulate pronotal humerus and entire surface of the body foveolate and opaque.

Minor: no carinulae on entire body, but all of the body parts except the second and succeeding segments of the gaster are foveolate and opaque.

MEASUREMENTS (mm) Major (Pueblo Nuevo, Mexico): HW 0.92, HL 0.92, SL 0.54, EL 0.14, PW 0.44.
Minor (Pueblo Nuevo, Mexico): HW 0.44, HL 0.54, SL 0.50, EL 0.10, PW 0.24.

COLOR Major: bicolorous, with posterior two-thirds of head surface, together with the lateral wings of the clypeus, yellowish white (fading to pale yellow in old specimens) and all the remainder of the body a sharply contrasting medium to dark brown; the first gastral tergite has bluish reflections; and the appendages exclusive of the mandibles are yellow.
Minor: body concolorous medium brown, appendages except for mandibles brownish yellow.
RANGE Tropical southern Mexico to Colombia. Literature records of the species from the West Indies are in error; they are based on the related species *P. bilimeki (= annectens),* q.v.
BIOLOGY J. T. Longino (1997) on *punctatissima* in Costa Rica: "This species thrives in disturbed areas, and it is often a pest ant. Nests are often in ephemeral cavities; soft rotten sticks, beneath bark flaps, in debris in forks of trees, etc." In Mexico winged reproductives have been found in nests during April and July.

FIGURE Upper: holotype, major. Above the mesosoma of the holotype is shown the outline of a paratype mesosoma, to illustrate variation in the propodeal angle within the same nest series. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (E. O. Wilson). Scale bars = 1 mm.



Pheidole rugiceps **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *rugiceps,* wrinkle- or crease-headed, denoting the completely carinulate surface of the head.

DIAGNOSIS **Major**: dorsal surface of the head except for clypeus and frontal triangle completely carinulate and foveolate; sides of the mesosoma and waist foveolate; gaster smooth and shiny; postpetiolar node laterally angulate.

Minor: head other than clypeus and frontal triangle, all of mesosoma, and sides of waist foveolate; occiput narrowed but lacking nuchal collar.

Longino (1997) describes the considerable geographic variation he found within Costa Rica as follows: "the shiny patch on dorsum of promesonotum is most developed on Atlantic slope specimens, is reduced on some Pacific slope specimens (Carara at 500 m, Rancho Quemado on the Osa), and absent on many Pacific slope specimens (Corcovado, Manuel Antonio, Carara at 30 m). Correlated with the reduction of the dorsal shiny spot is a change in color from dark brown to orange." I have placed light reddish brown specimens from the Arima Valley, Trinidad (600–700 m), light reddish brown specimens from Tingo María, Huanuco, Amazonian Peru, and reddish yellow ("orange") specimens from Cuzco Amazónico, Madre de Dios, further south in Amazonian Peru, as more farflung geographic variants of the same species.

MEASUREMENTS (mm) Holotype major: HW 0.90, HL 0.92, SL 0.64, EL 0.14, PW 0.42.
Paratype minor: HW 0.44, HL 0.54, SL 0.64, EL 0.10, PW 0.28.

COLOR Major: type series are dark, almost blackish brown, with a contrasting medium yellow fringe on the anterior rim of the head capsule, as shown; appendages plain medium to brownish yellow.

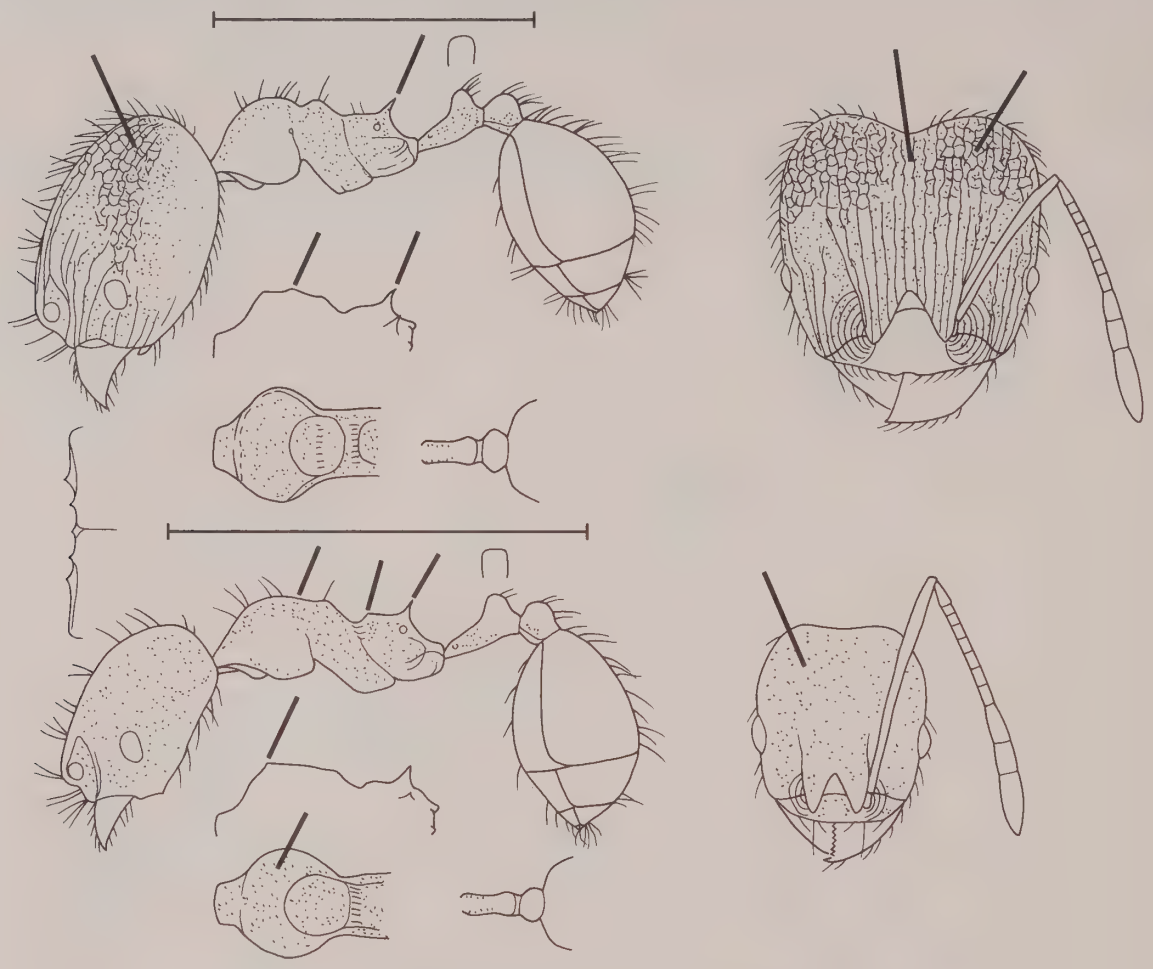
Minor: in type series, body dark brown except for slightly contrasting narrow anterior strip on the head capsule; scape and legs except tarsi light brown; funiculi and tarsi brownish yellow. Geographic variation that departs from these color patterns is described in the Diagnosis above.

RANGE Widespread in Costa Rica (Longino 1997), also recorded from Belize, Guatemala, Honduras, Panama, Trinidad, and Amazonian Peru.

BIOLOGY Nests in pieces of rotting wood on floor of mature wet forest (in Costa Rica, E. O. Wilson, unpublished and J. T. Longino 1997; and in Cuzco Amazónico, Peru, Stefan Cover). Winged queens were found in a nest at Tingo María, Huanuco, Peru, during 9–12 March by W. L. Brown and W. Sherbrooke.

Compare with members
of the *punctatissima* group

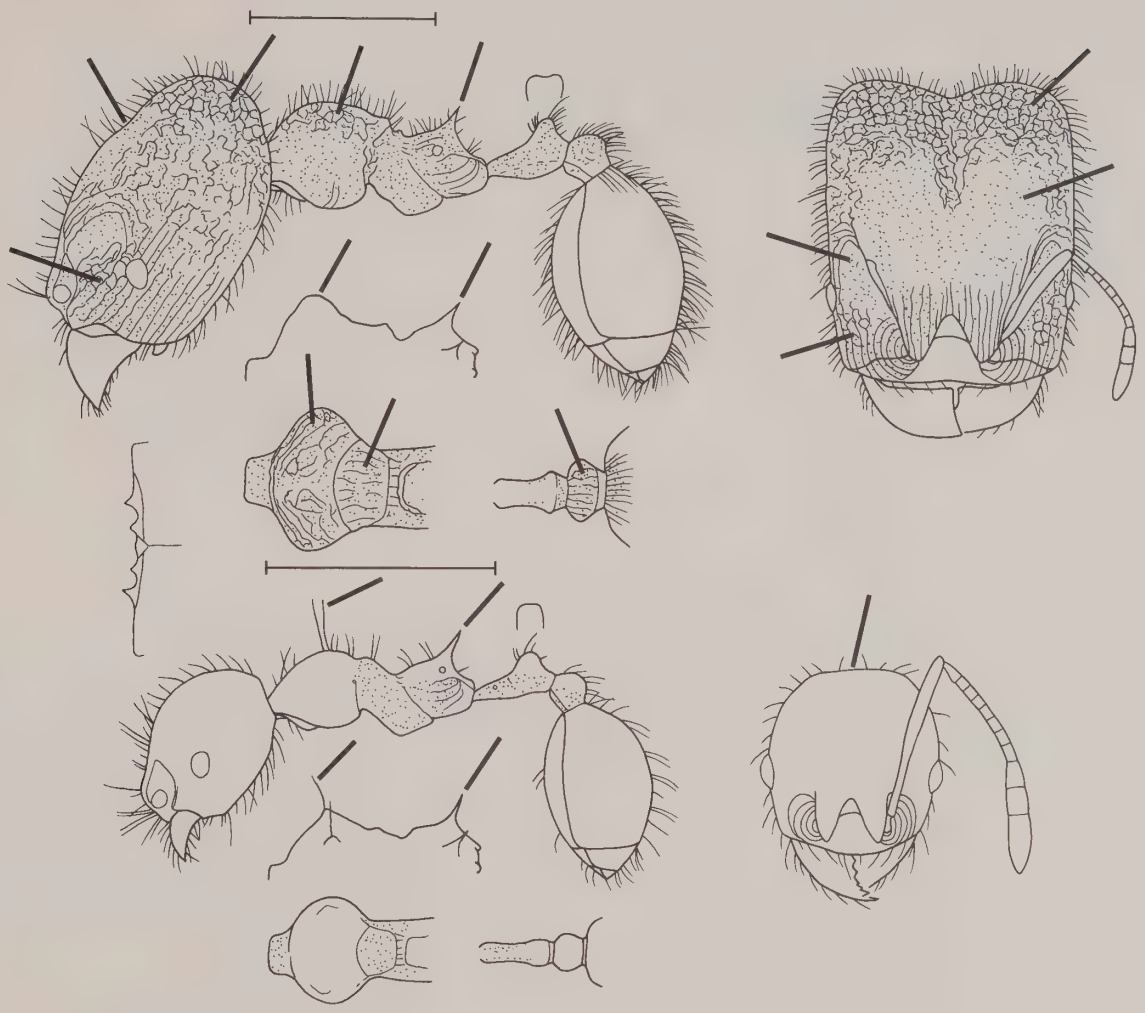
FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: Estación Biológica Los Tuxtlas, 10 km north-northwest of Sontecomepan, Veracruz, 18°35′N 95°05′W, 200 m (Philip S. Ward). Scale bars = 1 mm.



Pheidole tuxtlasana **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Names after the type locality.
DIAGNOSIS A yellow species, distinguished from other members of the *punctatissima* group as follows.
Major: rugoreticula cover rear quarter of the dorsal head surface except for a narrow band of carinulae at the midline, with some rugoreticula extending all the way along the side of the head to the eye; promesonotum trilobous in dorsal-oblique view; propodeal spines long and stout; postpetiolar node diamond-shaped, with angular lateral margins.
Minor: humerus angulate, anterior face of propodeum in side view topped by an obtuse angle and descends steeply to the metanotum; mesosomal pilosity sparse; head and dorsal surface of the mesosoma foveolate and opaque.
MEASUREMENTS (mm) Holotype major: HW 0.72, HL 0.72, SL 0.52, EL 0.12, PW 0.34.
Paratype minor: HW 0.38, HL 0.44, SL 0.52, EL 0.08, PW 0.26.
COLOR Major and minor: concolorous yellow.
RANGE Known only from the type locality.
BIOLOGY The type series was sifted from litter on the floor of lowland forest.

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: Gomez Fariás, Tamaulipas, 400–600 m (Cornell University Mexico Field Party, 1964). Scale bars = 1 mm.



Pheidole arctos **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *arctos,* bear, alluding to the large size and rough, shaggy appearance of the major.

DIAGNOSIS Close to *gangamon,* also of Mexico, and probably also to *epetrion* and *thrasys,* but distinguished from these and other members of the *scrobifera* group by the following combination of traits.

Major: rear one-fourth of dorsal head surface, rear one-half of the lateral head surfaces, and area between the eye and frontal lobes rugoreticulate; anterior half of the frontal lobes carinulate; entire central half of the dorsal head surface foveolate only; all of promesonotal and postpetiolar dorsa carinulate to rugoreticulate; anterior central strip of first gastral tergite longitudinally striate; humerus composing a very large lobe that projects high above the mesonotal convexity; posterior half of dorsal head profile weakly concave.

Minor: the two humeri conulate, the tip of each bearing very long hairs; head and prothorax entirely smooth and shiny.

MEASUREMENTS (mm) Holotype major: HW 1.28, HL 1.60, SL 0.62, EL 0.18, PW 0.82.
Paratype minor: HW 0.62, HL 0.64, SL 0.60, EL 0.12, PW 0.42.

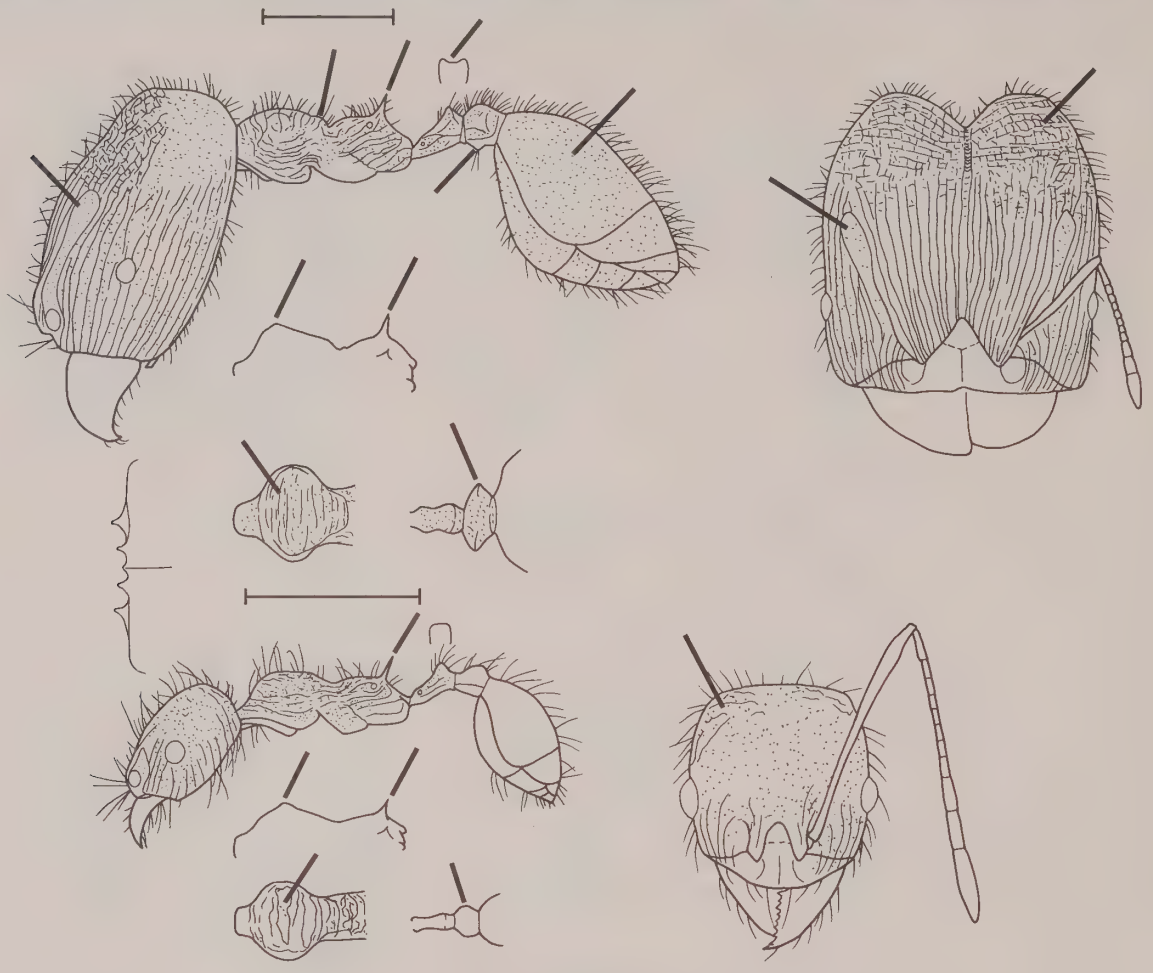
COLOR Major and minor: body dark brown, appendages medium brown, tarsi yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

Compare with species listed
in the Diagnosis below

FIGURE Upper: major, syntype of var. *grayi*. Lower: minor, syntype of var. *grayi*. CUBA: Limones. Scale bars = 1 mm.

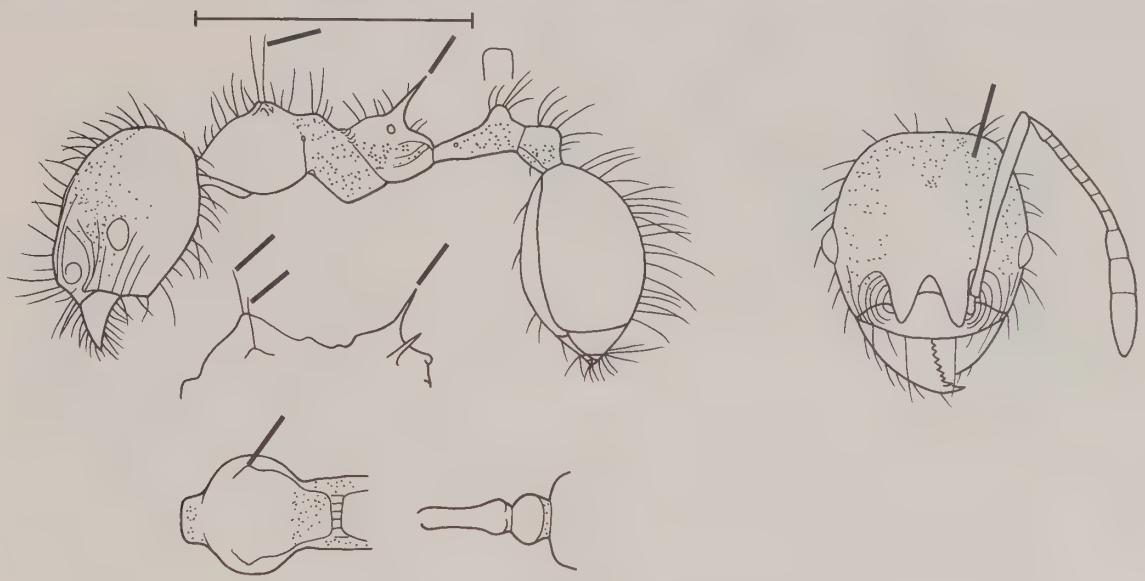


Pheidole cubaensis Mayr

Pheidole cubaensis Mayr 1862: 747. (Type locality: Cuba.) Syn.: *Pheidole cubaensis* var. *grayi* Mann 1920b: 426, n. syn. (junior homonym of *P. grayi* Forel 1902c: 167, *nec cubaensis*.)

TYPES Naturhist. Mus. Wien.
ETYMOLOGY Named after the country of origin.
DIAGNOSIS A large, dark reddish brown member of the *scrobifera* group.
Major: deep antennal scrobes present; rear third of the dorsal head surface rugoreticulate; propodeal spines moderately long and slender; postpetiole cornulate; a small subpostpetiolar process present; pilosity short, dense, and erect.
Minor: postpetiolar node diamond-shaped; propodeal spines long, slender, and straight; venter of head transversely carinulate; dorsa of head and mesosoma almost entirely foveolate and opaque.
A unique species, placed in the *scrobifera* group tentatively because of the habitus of the major, but the minor shows overall resemblance to the *tristis*-group species *alayoi, macromischoides,* and *naylae* of Cuba and *androsana* of the Bahamas.
MEASUREMENTS (mm) Major ("var. *grayi*" syntype): HW 1.92, HL 2.16, SL 0.86, EL 0.20, PW 0.82.
Minor ("var. *grayi*" syntype): HW 0.66, HL 0.72, SL 0.82, EL 0.14, PW 0.44.
COLOR Major and minor: body dark reddish brown, appendages dark yellow to yellowish brown.
RANGE Cuba.
BIOLOGY Evidently a rare species: few collections have been made despite its conspicuously large size. I found a colony in Blanco's Woods, Las Villas Province, Cuba, with winged reproductives on 25 June 1953.

FIGURE Holotype, minor. ECUADOR: Endesa Forest Reserve, Pichincha (Leeanne Tennant-Alonso). Scale bar = 1 mm.

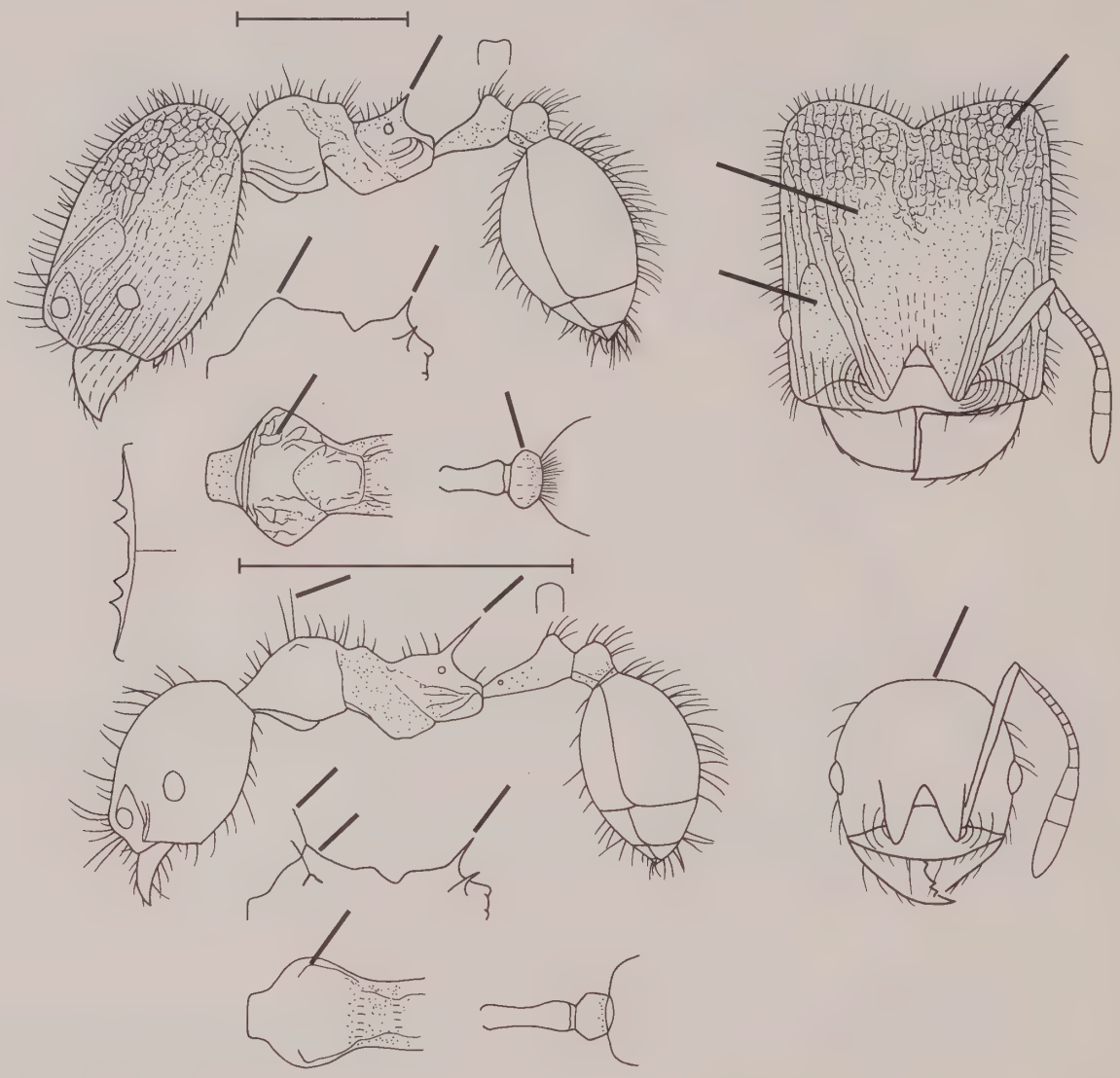


Pheidole epetrion **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *epetrion,* needle, referring to the needle-like propodeal spine.
DIAGNOSIS A member of the *scrobifera* group known only from the **minor**, close to *arctos* of northeastern Mexico and *thrasys* of Panama, differing in the longer propodeal spines, carinulate genae, absence of a nuchal collar, and mostly foveolate, opaque dorsal half of the head capsule.
MEASUREMENTS (mm) Holotype minor: HW 0.66, HL 0.68, SL 0.70, EL 0.14, PW 0.42.
COLOR Minor: body blackish brown, tarsi yellow, rest of appendages medium brown.
RANGE Known only from the type locality.
BIOLOGY Collected on the floor of second-growth forest.

Compare with *arctos, epetrion, simonsi, thrasys*

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: Pueblo Nuevo, near Tetzonapa (E. O. Wilson). Scale bars = 1 mm.



Pheidole gangamon **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *gangamon,* a small, round net, referring to the occipital rugoreticulum of the major.

DIAGNOSIS Close to *arctos,* but distinguishable from it (and other members of the *scrobifera* group) by the pattern of sculpturing and details of body form in the **major**, and in the unusually long, needle-like propodeal spines and piligerous cornicles of the humeri, also as shown.

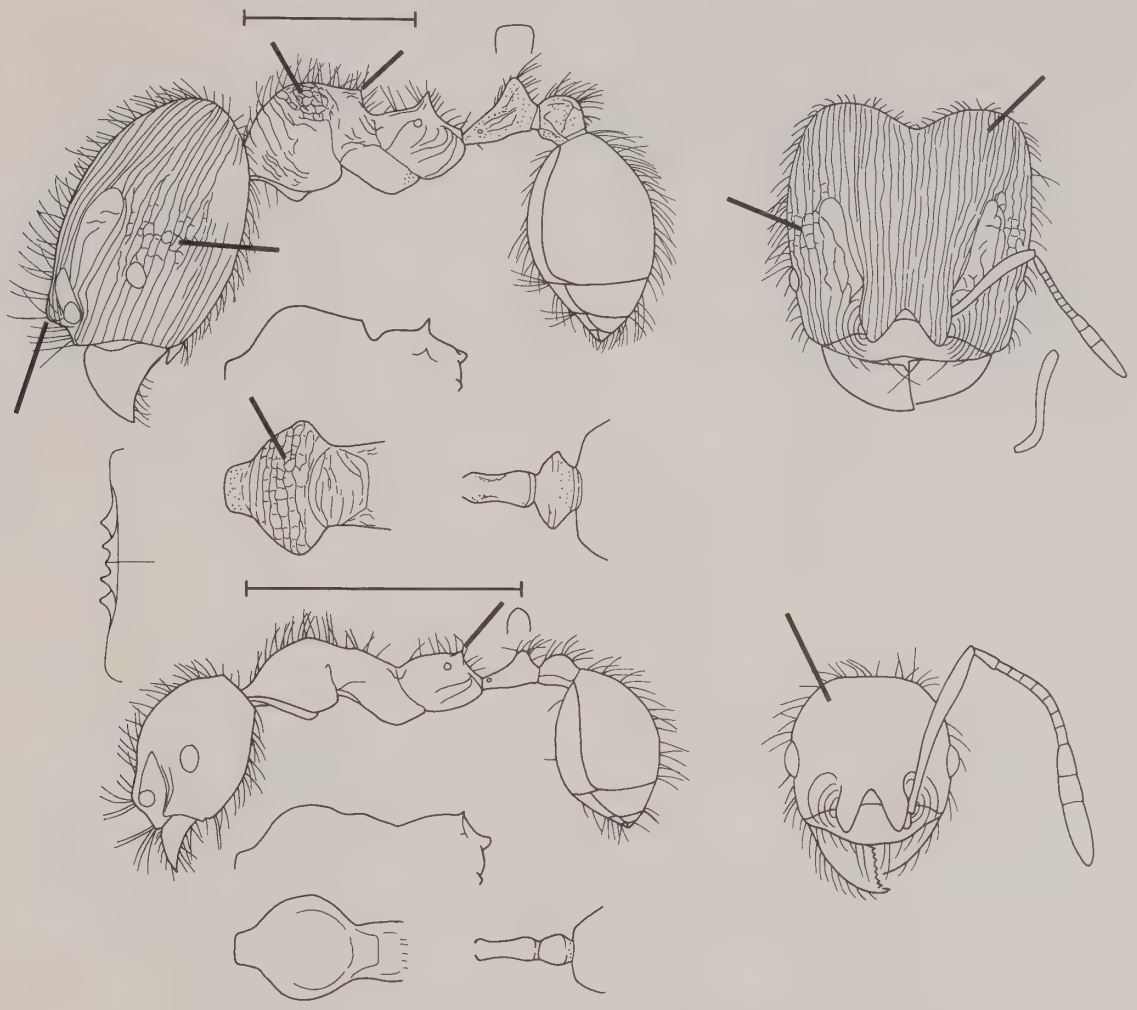
MEASUREMENTS (mm) Holotype major: HW 1.24, HL 1.54, SL 0.58, EL 0.16, PW 0.72.
Paratype minor: HW 0.58, HL 0.58, SL 0.58, EL 0.12, PW 0.38.

COLOR Major: body and appendages medium reddish brown; gaster dark brown.
Minor: light brown.

RANGE Known only from the type locality.

BIOLOGY The nest of the type colony was in black clayey soil in the middle of a path through degraded lowland rainforest. The single entrance hole was surrounded by a narrow ring of excavated earth. Major workers were scarce (E. O. Wilson).

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Madeira-Mamoré railway track, km 284, Rondônia (W. M. Mann). Scale bars = 1 mm.



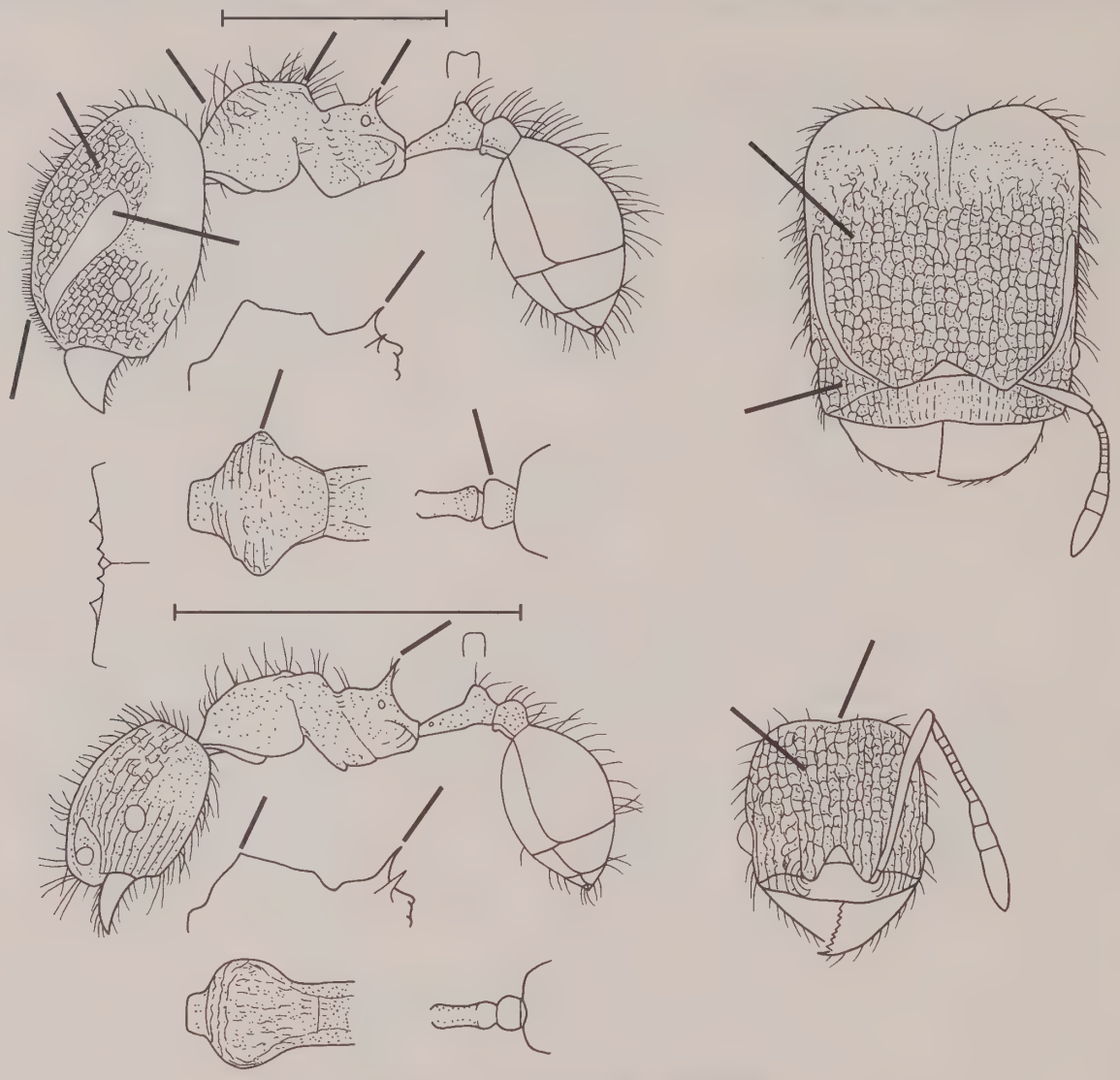
Pheidole mamore Mann, **new status**

Pheidole guilelmimuelleri subsp. *mamore* Mann 1916: 429.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the type locality.
DIAGNOSIS Distinguished among members of the *scrobifera* group (as well as the somewhat similar *antillana, avia, bucculenta, guilelmimuelleri, hetschkoi, heyeri, hortonae, praeses,* and *rhytifera* in the *tristis* group) as follows.
Major: rugoreticulum on head limited to a patch posterior to each eye and another inside the anterior part of each antennal scrobe; anterior strip of pronotal dorsum transversely carinulate, the remainder rugoreticulate; mesonotal convexity subangulate in side view.
Minor: propodeal spines reduced to denticles; entire body smooth and shining, with the sole sculpturing being the circular carinulae around the antennal fossae.
MEASUREMENTS (mm) Lectotype major: HW 1.64, HL 1.64, SL 0.74, EL 0.20, PW 0.90.
Paralectotype minor: HW 0.60, HL 0.64, SL 0.68, EL 0.14, PW 0.38.
COLOR Major: medium to dark reddish brown, appendages light reddish brown.
Minor: body plain medium ("chocolate") brown, appendages medium brownish yellow.
RANGE In addition to the types, I have seen material from around Manaus, Amazonas, Brazil; near Puerto Maldonado, Leticia, and Tingo Maria, Peru; Suriname; and Guyana.
BIOLOGY Stefan Cover and John E. Tobin found this species on the floor of forest transitional from terra firme to floodplain at Cuzco Amazónico, near Puerto Maldonado, Peru. I encountered it in primary rainforest near Manaus. Colonies nest in pieces of rotten wood on the forest floor.

Compare with members
of the *scrobifera* group

FIGURE Upper: holotype, major (22 km southwest of Puyo, Pastaza, Ecuador). Lower: paratype, minor (tentatively associated with holotype major; 25 km north of Puyo, Pastaza, Ecuador, 1000 m). (Stewart B. Peck and Jarmila Kukalová-Peck.) Scale bars = 1 mm.



Pheidole peckorum **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named in honor of the collectors, both distinguished entomologists and field researchers.

DIAGNOSIS A strikingly unique species within the *scrobifera* group and *Pheidole* in general.

Major: anterior two-thirds of the dorsal head surface covered by a dense felt of very short, exactly erect hairs of uniform length; antennal scrobe deep, extending posteriorly past the transverse midline of the head and devoid of sculpturing; head rectangular in full-face view, and all of the anterior three-fourths except the central piece of the clypeus and frontal triangle rugoreticulate.

Minor: all of the anterior five-sixths of the head capsule dorsum, including the frontal lobes, rugoreticulate; humerus right-angular in dorsal-oblique view; propodeal spines very long.

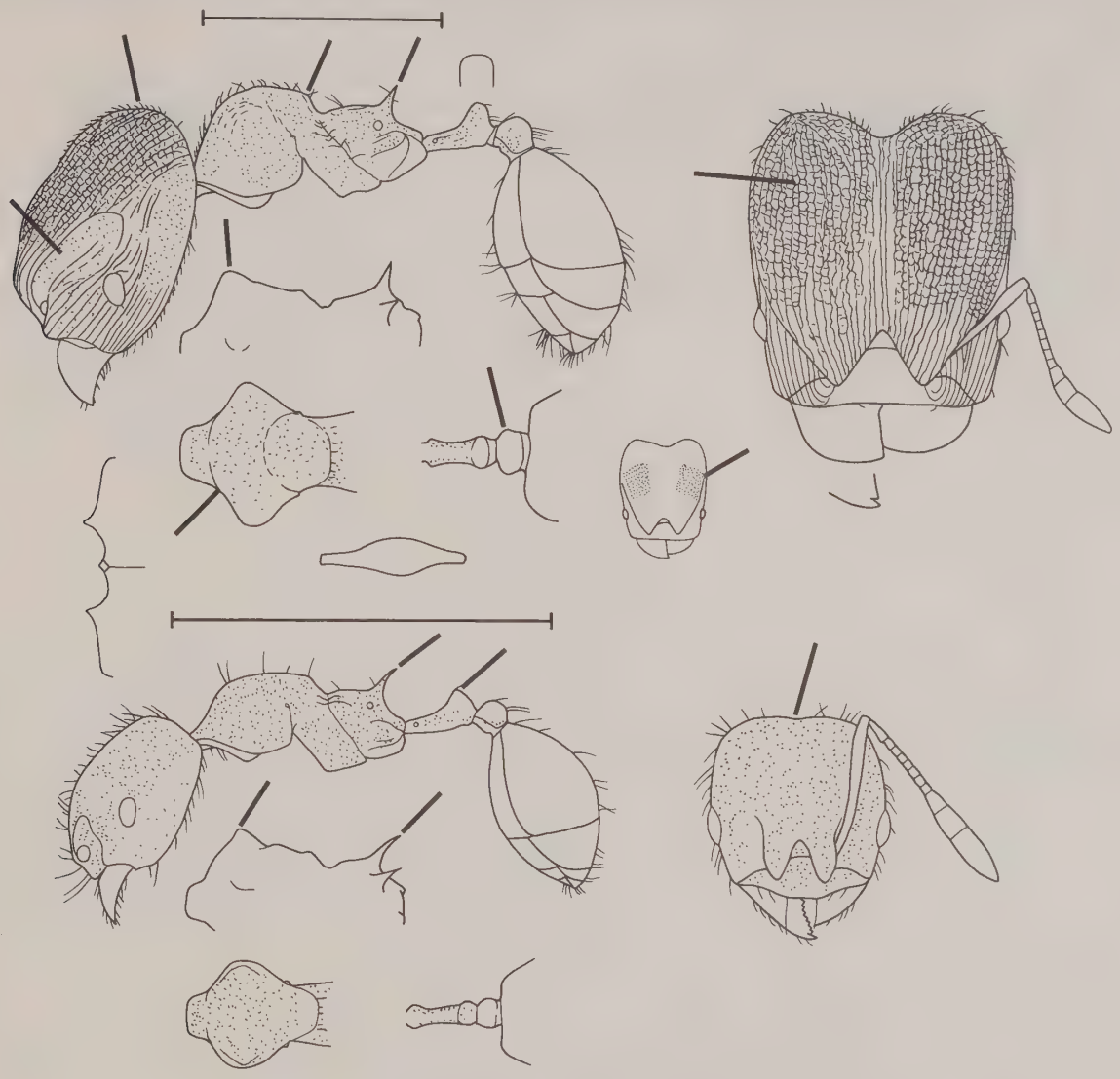
MEASUREMENTS (mm) Holotype major: HW 1.04, HL 1.26, SL 0.50, EL 0.12, PW 0.60.
Paratype minor: HW 0.54, HL 0.56, SL 0.50, EL 0.06, PW 0.34.

COLOR Major: body medium reddish brown except gaster which is light brown, appendages yellow.
Minor: concolorous reddish yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

FIGURE Upper: major (right hind femur shown at bottom). Lower: minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo (Stefan Cover). (Type locality: Jiménez, near Guapiles, Costa Rica.) Scale bars = 1 mm.



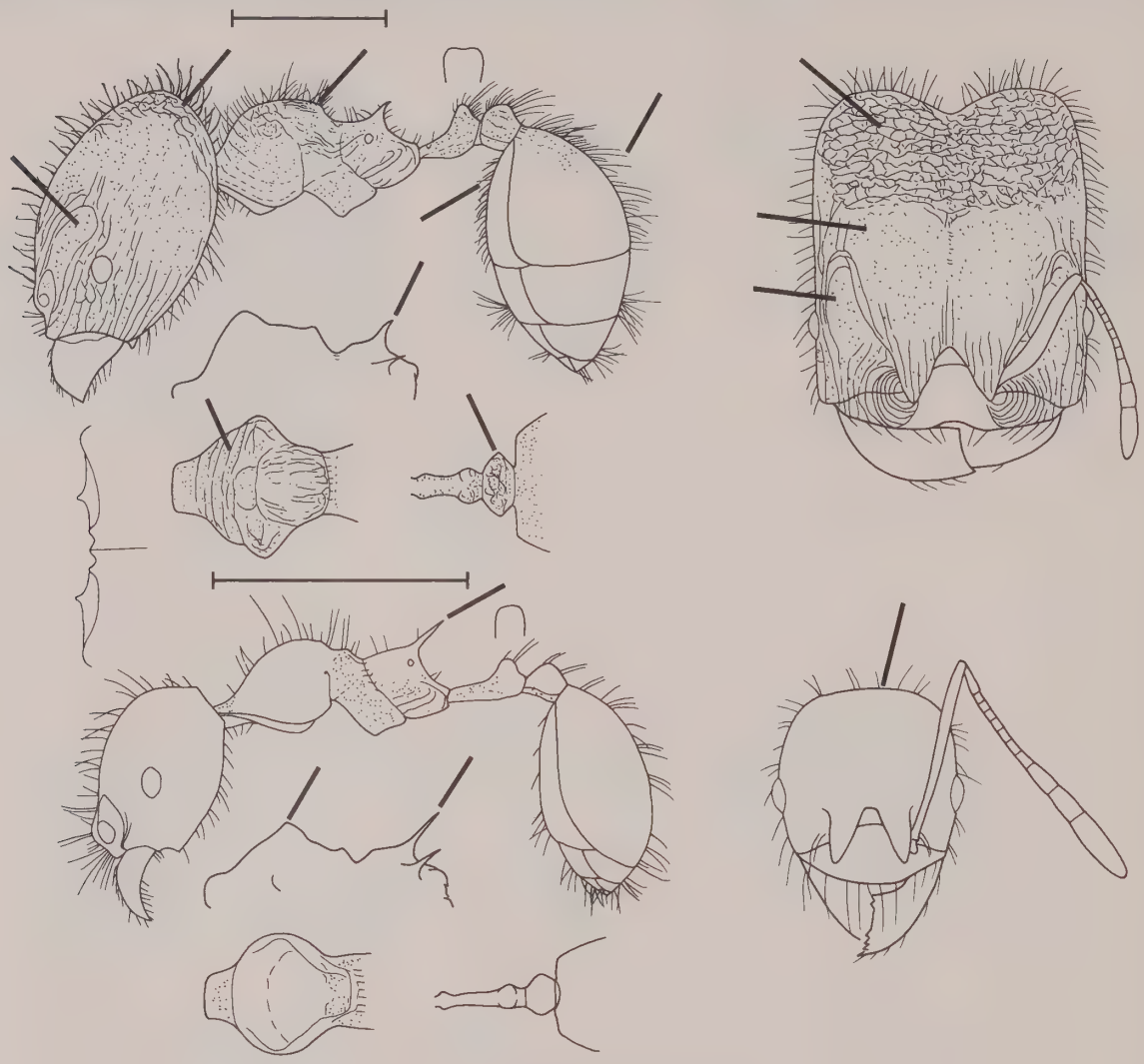
Pheidole scrobifera Emery

Pheidole scrobifera Emery 1896g: 73.

TYPES Mus. Civ. Stor. Nat. Genova.
ETYMOLOGY L *scrobifera,* trench-bearer, alluding to the antennal scrobes.
DIAGNOSIS Distinguished from other members of the *scrobifera* group as follows.
Major: pilosity very short, absent on anterior half of dorsal profile of head and present as uniform, suberect hairs along the posterior half of the profile; entire dorsal head surface posterior to the eyes rugoreticulate; promesonotal sculpturing consisting entirely of foveolation; petiolar and postpetiolar nodes entirely smooth and shiny; head capsule with bilateral dark spots.
Minor: humerus cornulate; propodeal spines long and slender; dorsal head surface and all of mesosoma foveolate, with no carinulae or rugulae anywhere on the body.
MEASUREMENTS (mm) Major (La Selva Biological Station, Costa Rica): HW 0.88, HL 1.08, SL 0.42, EL 0.14, PW 0.54.
Minor (La Selva Biological Station): HW 0.44, HL 0.46, SL 0.36, EL 0.10, PW 0.30.
COLOR Major: head and mandibles light reddish brown, with bilateral dark brown spots on the dorsal surface, as illustrated; mesosoma a slightly lighter shade of light reddish brown; waist, gaster, legs, and antennae brownish yellow.
Minor: head and mesosoma dark, slightly reddish yellow; appendages clear medium yellow.
RANGE Atlantic slope of Costa Rica to 900 m (J. T. Longino 1997).
BIOLOGY According to Longino (1997), as well as Stefan Cover and James C. Trager (independent field notes), *scrobifera* is relatively common in mature wet forest, nesting in rotten logs and other pieces of rotten wood on the forest floor. Workers have been observed foraging at night.

Compare with *arctos, epetrion, gangamon, thrasys*

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (Stefan Cover). Scale bars = 1 mm.



Pheidole simonsi **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named in honor of my friend, the late Howard Simon, former managing editor of the Washington Post, Curator of the Nieman Fellows, and fellow entomologist.

DIAGNOSIS Distinguished within *Pheidole* generally by the following set of character states.

Major: scrobes extend halfway up the head capsule; entire rear third of head dorsum, including occiput, rugoreticulate, but central third devoid of any sculpturing except scattered foveolae; postpetiolar node rugoreticulate; ventral profile of first gastral tergite lined with dense semierect hairs of uniform length.

Minor: propodeal spines very long, thin, and needle-like; body almost completely devoid of any sculpturing, instead smooth and shiny everywhere. The minor is very close to *thrasys,* differing in the slightly broader occiput, rudimentary nuchal collar, and brown tarsi.

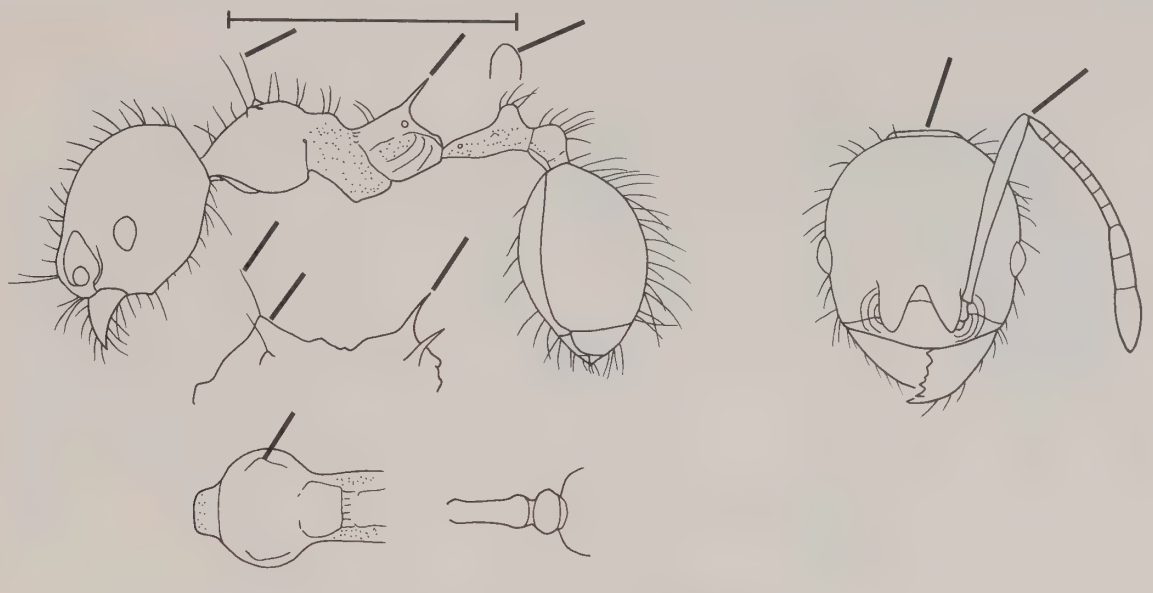
MEASUREMENTS (mm) Holotype major: HW 1.34, HL 1.60, SL 0.58, EL 0.14, PW 0.78.
Paratype minor: HW 0.66, HL 0.70, SL 0.66, EL 0.14, PW 0.44.

COLOR Major: head and mesosoma medium reddish brown, waist and mandibles plain dark brown, gaster black, antennae and legs medium brown.
Minor: head, waist, gaster, and femora dark, almost blackish brown; mandibles, mesosoma, and rest of leg segments medium brown.

RANGE Both Atlantic and Pacific slopes of Costa Rica to 800 m (J. T. Longino 1997).

BIOLOGY J. T. Longino (1997): "This species occurs in mature moist to wet forest. It nests in the soil, with a main nest chamber about 10 cm deep. When workers excavate soil from the nest, they often form a characteristic flat arena around the nest entrance, surrounded by a palisade-like ring of soil. Their nests contain seed caches, and the majors have massive heads, which suggest granivory as a major component of the diet. They are not restricted to granivory, however, since workers readily recruit to baits of several kinds." I found *simonsi* nests of the kind just described in bare stretches of clay-soil paths through mature forest at the La Selva Biological Station.

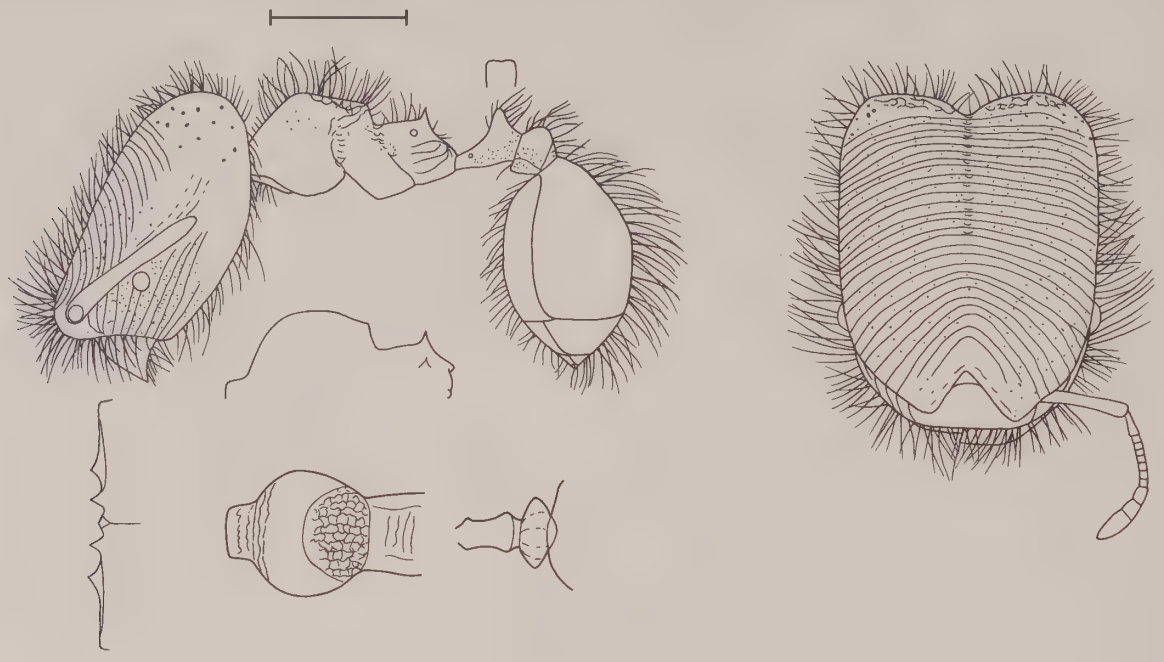
FIGURE Holotype, minor. PANAMA: Barro Colorado Island (William L. Brown and Elwood S. McCluskey). Scale bar = 1 mm.



Pheidole thrasys **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *thrasys,* bold, courageous.
DIAGNOSIS A member of the *scrobifera* group known only from the **minor**, close to *arctos* of northeastern Mexico and *epetrion* of Ecuador, differing in the narrowed occiput, possession of a nuchal collar, and completely smooth and shiny mesonotum; also close to *simonsi,* differing in its narrower occiput, well-developed nuchal collar, and yellow tarsi.
MEASUREMENTS (mm) Holotype minor: HW 0.60, HL 0.62, SL 0.60, EL 0.12, PW 0.40.
COLOR Minor: body dark brown, tarsi yellow, rest of appendages light yellow.
RANGE Known only from the type locality, and from Lancetilla, near Tela, Honduras (W. L. Brown).
BIOLOGY The Honduras series was collected in wet lowland forest.

FIGURE Major. GUATEMALA: San Jose (E. S. Ross, in Mus. Comp. Zool. Harvard). Compared with unique holotype major, Almoloya, Oaxaca, Mexico, collected by Frederick Knab, in Nat. Mus. Nat. Hist U. S. Scale bar = 1 mm.



Pheidole tisiphone Wheeler

Pheidole tisiphone Wheeler 1911k: 203. Combination in *Pheidole (Elasmopheidole)* by Emery 1915g: 190.

TYPES Nat. Mus. Nat. Hist. U. S.

ETYMOLOGY Tisiphone, Avenger of Murders, one of the Furies of Greek mythology.

DIAGNOSIS A large member of the *scrobifera* group, with a bizarre **major** instantly recognizable by shield-shaped head in full-face view, with the frontal lobes expanded laterally to touch the lateral margins of the head at the level of the eyes and behind it and extended anteriorly almost to touch the anterior clypeal border; by the very dense, long hairs covering the entire head, with those around the region of the eye curving posteriorly; and by the deep, narrow antennal scrobes. The mesonotum is rugoreticulate in the Guatemalan specimen, and mostly carinulate in the unique holotype, but otherwise the two specimens are very close.

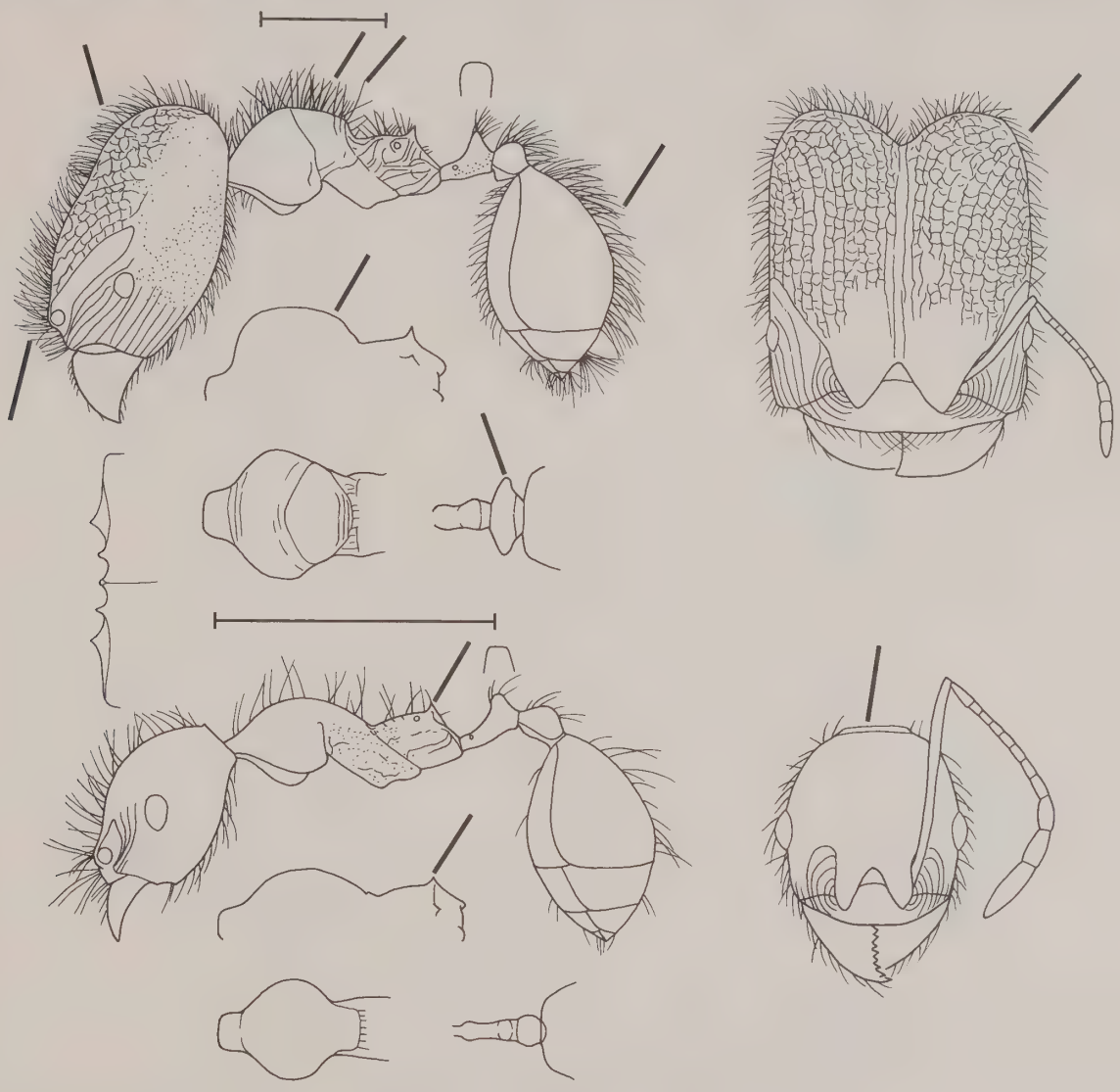
MEASUREMENTS (mm) Holotype major: HW 1.80, HL 2.16, SL 0.76, EL 0.20, PW 1.00.

COLOR Major: body light reddish brown, appendages light reddish to yellowish brown.

RANGE Known only from the two major workers noted above, from Oaxaca, Mexico, and Guatemala.

BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (E. O. Wilson). Scale bars = 1 mm.



Pheidole vestita **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *vestita,* clothed, wearing garments, referring to the unusually dense pilosity of the major.

DIAGNOSIS Distinguished from other members of the *scrobifera* group by the following suite of character states.

Major: entire body covered by long, very dense, suberect to erect hairs; promesonotum smoothly semicircular in dorsal-oblique view; posterior two-thirds of dorsal head surface rugoreticulate; frontal lobes and all of promesonotum entirely smooth and shiny.

Minor: occiput narrowed, with nuchal collar; all of head smooth and shiny except for circular carinulae around antennal fossae; all of promesonotal border and all of waist smooth and shiny; propodeal spines short and erect.

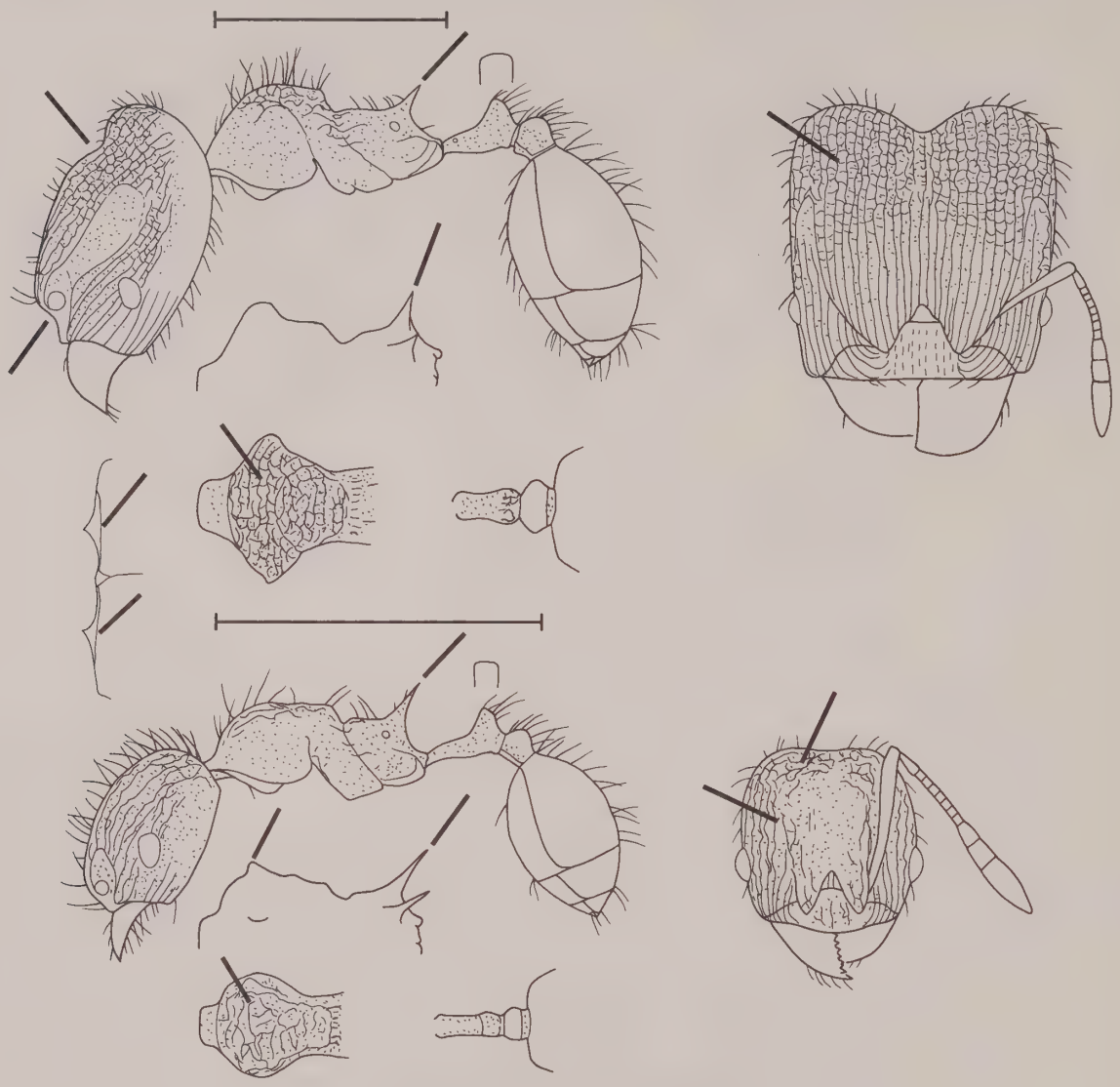
MEASUREMENTS (mm) Holotype major: HW 1.86, HL 2.22, SL 0.88, EL 0.22, PW 0.96.
Paratype minor: HW 0.60, HL 0.64, SL 0.70, EL 0.14, PW 0.38.

COLOR Major: posterior three-fourths of head capsule dark reddish brown, anterior one-fourth medium reddish brown; mesosoma and waist dark to medium reddish brown; gaster plain dark reddish brown; appendages light reddish brown.
Minor: posterior four-fifths of head capsule dark brown, anterior one-fifth light brown; mesosoma and waist light brown; gaster dark brown; appendages yellowish brown.

RANGE Known only from the type locality.

BIOLOGY Nests in clayey soil of mature forest trail (E. O. Wilson); observed foraging at night on grassy section of trail (Longino 1997). The type colony was from a soil nest in the middle of a forest trail, surrounded by excavated earth.

FIGURE Upper: holotype, major. Lower: paratype, minor. HONDURAS: Lancetilla, near Tela (William L. Brown). Scale bars = 1 mm.



Pheidole wardi **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the distinguished myrmecologist and field biologist Philip S. Ward.

DIAGNOSIS A very distinctive species, easily distinguished by the following combination of traits.

Major: posterior profile of dorsal head surface strongly concave; hypostomum 2-toothed; entire posterior half of cephalic dorsum and all of promesonotum rugoreticulate; propodeal spines very long and stout.

Minor: occiput and promesonotum rugoreticulate; lateral thirds of head in full-face view rugulose; humeri cornulate; propodeal spines very long and thin.

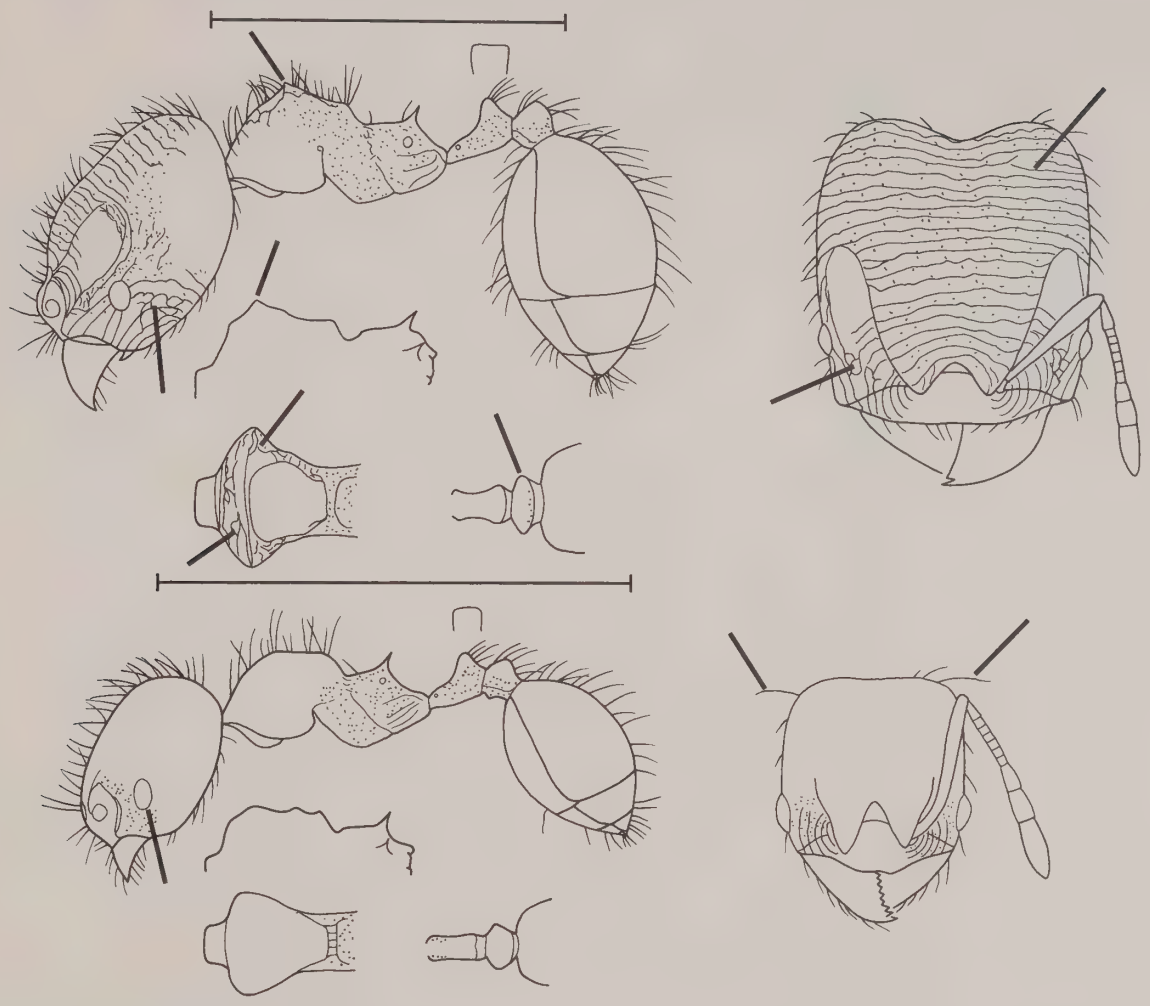
MEASUREMENTS (mm) Holotype major: HW 1.04, HL 1.10, SL 0.50, EL 0.14, PW 0.62.
Paratype minor: HW 0.52, HL 0.52, SL 0.44, EL 0.10, PW 0.36.

COLOR Major: gaster and legs yellowish brown, rest of body and mandible reddish brown.
Minor: concolorous brownish yellow.

RANGE Known only from the type locality.

BIOLOGY Collected in lowland rainforest.

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Finca El Recreo, Magdalena, 850 m (Charles Kugler). Scale bars = 1 mm.

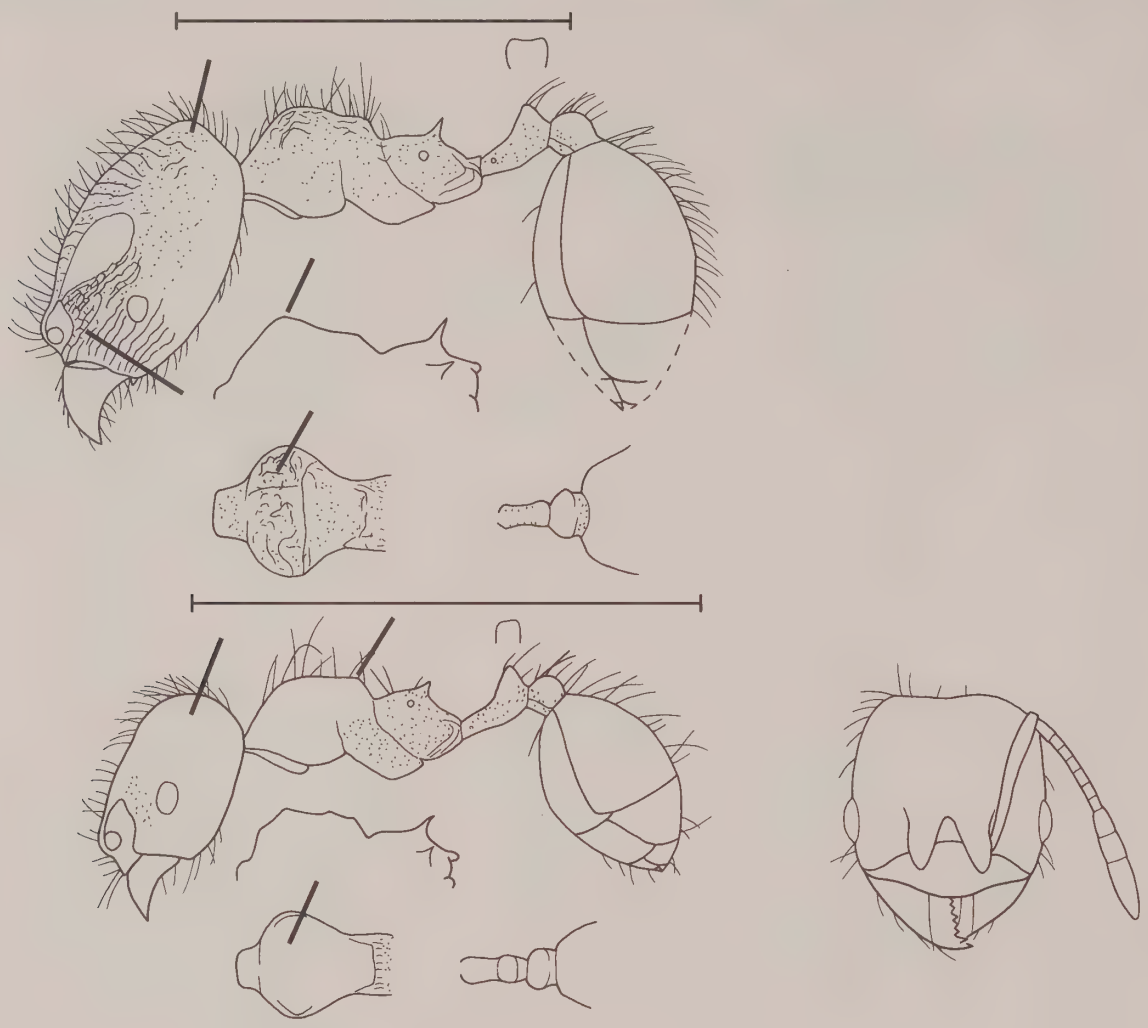


Pheidole dorsata **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *dorsata,* of a ridge or back of a hill, referring to the peaked pronotum of the major in side view.
DIAGNOSIS A member of the *tachigaliae* group, characterized by 11-segmented antennae, and distinguished within it as follows.
Major: in side view, pronotal profile broken by a sharp obtuse angle; rugoreticula present mesad and laterad to eye; all of dorsum of head posterior to eye transversely carinulate except for antennal scrobes, which are smooth; humeri and anterior pronotal margin rugoreticulate; postpetiole from above very broad and narrowly elliptical in shape.
Minor: space between eyes and antennal fossae carinulate, foveolate, and opaque; rest of head smooth and shiny; in full-face view, a single, very long curving hair extends from each occipital corner; eye oval and set well forward on the head.
MEASUREMENTS (mm) Holotype major: HW 0.68, HL 0.74, SL 0.30, EL 0.08, PW 0.44.
Paratype minor: HW 0.36, HL 0.40, SL 0.28, EL 0.06, PW 0.26.
COLOR Major: body light brown, appendages yellowish brown.
Minor: body medium brown, appendages brownish yellow.
RANGE Known only from the type locality.
BIOLOGY The type colony was found in a shaded coffee plantation.

Compare with *mendicula*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. SURINAME: Paramaribo. Scale bars = 1 mm.

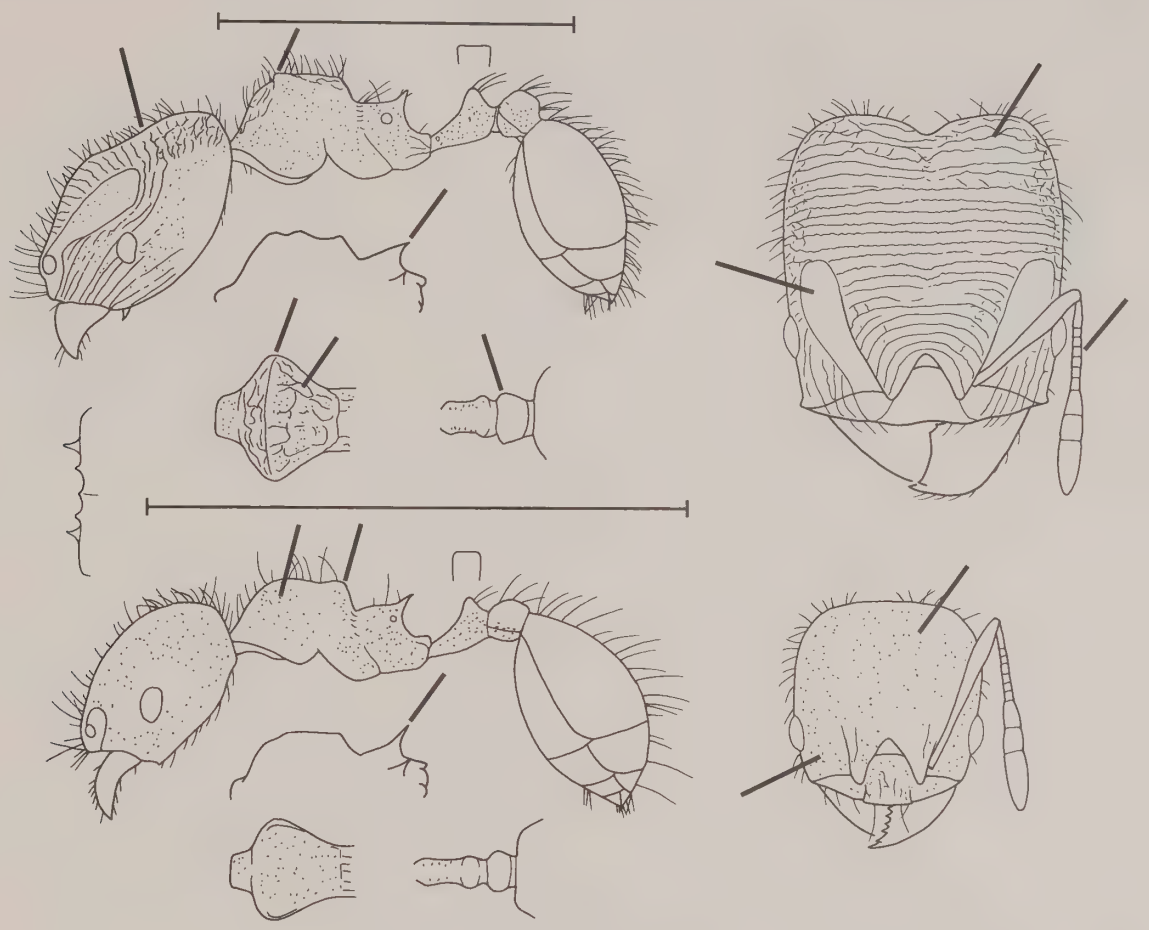


Pheidole gibbata Borgmeier, **new status**

Pheidole transversostriata subsp. *gibbata* Borgmeier 1934: 10.

TYPES Mus. Zool. Univ. São Paulo.
ETYMOLOGY L *gibbata,* hump-backed, crooked.
DIAGNOSIS A very small, yellowish brown member of the *tachigaliae* group, closest to *mendicula* (q.v.) and differing from that species as follows.
Major: occiput transversely carinulate; rugoreticula present between eye and antennal fossa and on pronotal dorsum; transverse mid-pronotal carina less prominent and not protruding from dorsal pronotal profile in side view.
Minor: head and pronotum smooth and shiny.
MEASUREMENTS (mm) Lectotype major: HW 0.56, HL 0.60, SL 0.30, EL 0.08, PW 0.36.
Paralectotype minor: HW 0.32, HL 0.38, SL 0.26, EL 0.06, PW 0.24.
COLOR Major: body medium yellowish brown except for gaster, which is light brown.
Minor: concolorous medium yellowish brown.
RANGE Known from the type locality (Paramaribo, Suriname) and Cañaveral, Magdalena, Colombia, 200 m (Philip S. Ward).
BIOLOGY Ward's Colombian series was sifted from litter and rotting wood in dry tropical forest.

FIGURE Upper: syntype, major. Lower: syntype, minor. PANAMA: Barro Coorado Island (William M. Wheeler). Scale bars = 1 mm.



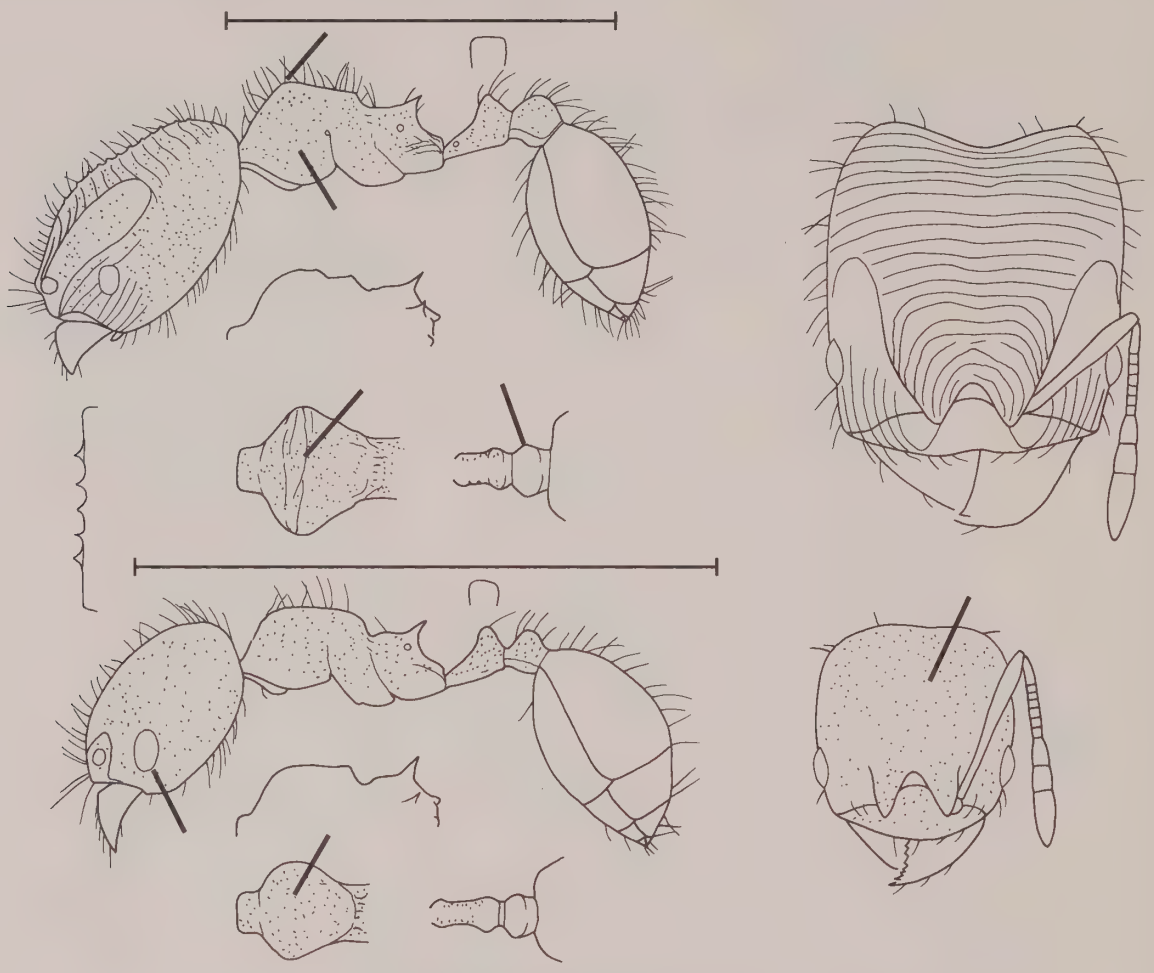
Pheidole mendicula Wheeler

Pheidole (Hendecapheidole) mendicula Wheeler 1925e:172.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *mendicula,* little and beggarly, or poor, presumably alluding to the small size and reduction of antennal segmentation.
DIAGNOSIS A very small, reddish brown member of the *tachigaliae* group, which group is characterized by 11-segmented antennae, and distinguished within it as follows.
Major: occiput rugoreticulate, antennal scrobes, frontal triangle, and mid-clypeus smooth, and rest of dorsal head surface transversely carinulate; all of head and mesosoma foveolate and punctate; strong transverse ridge just breaks the surface of the pronotal profile in side view as a right-angle; posterior half of dorsal head profile in side view weakly concave; postpetiole from above trapezoidal.
Minor: all of head and mesosoma foveolate and opaque; carinulae absent mesad to eye; propodeal spines backward projecting.
MEASUREMENTS (mm) Syntype major: HW 0.60, HL 0.66, SL 0.32, EL 0.08, PW 0.38.
Syntype minor: HW 0.34, HL 0.34, SL 0.26, EL 0.06, PW 0.24.
COLOR Major and minor: body concolorous medium reddish brown, appendages a contrasting yellowish brown.
RANGE Besides Wheeler's type collection in Panama, Longino (1997) has recorded *mendicula* from both the Atlantic and Pacific lowlands of Costa Rica; and the species has been collected widely southward to Trinidad and Amazonian Brazil, Peru, and Ecuador.
BIOLOGY *P. mendicula* is an adaptable species. At La Selva, near Puerto Viejo, Costa Rica, Longino (1997) found a nest in the clay soil of a lawn surrounded by rainforest. Other sites include a second-growth forest and a rotten branch in a bamboo grove (Trinidad), and a rotten stick on the floor of terra firme rainforest (Brazil). On the Osa Peninsula of Costa Rica, Longino (1997) collected a worker from an extrafloral nectary of *Passifolia pittieri*. Winged queens have been found in nests from May to July.

Compare with other members
of the *tachigaliae* group

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: Manaus to Itacoatiara, Km 24, Amazonas (William L. Brown). Scale bars = 1 mm.



Pheidole pedana **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *pedana,* of the earth.

DIAGNOSIS A tiny, yellow member of the *tachigaliae* group, characterized by 11-segmented antennae, and distinguished within it as follows.

Major: all of head and mesosoma foveolate and opaque; all of head carinulate except antennal scrobes, frontal triangle, and mid-clypeus; no part of the body rugoreticulate; mid-pronotal profile bluntly and weakly angulate; postpetiole from above oval.

Minor: head and mesosoma completely foveolate and opaque; eye set very far forward, its distance to the genal border only about 2/3 its length.

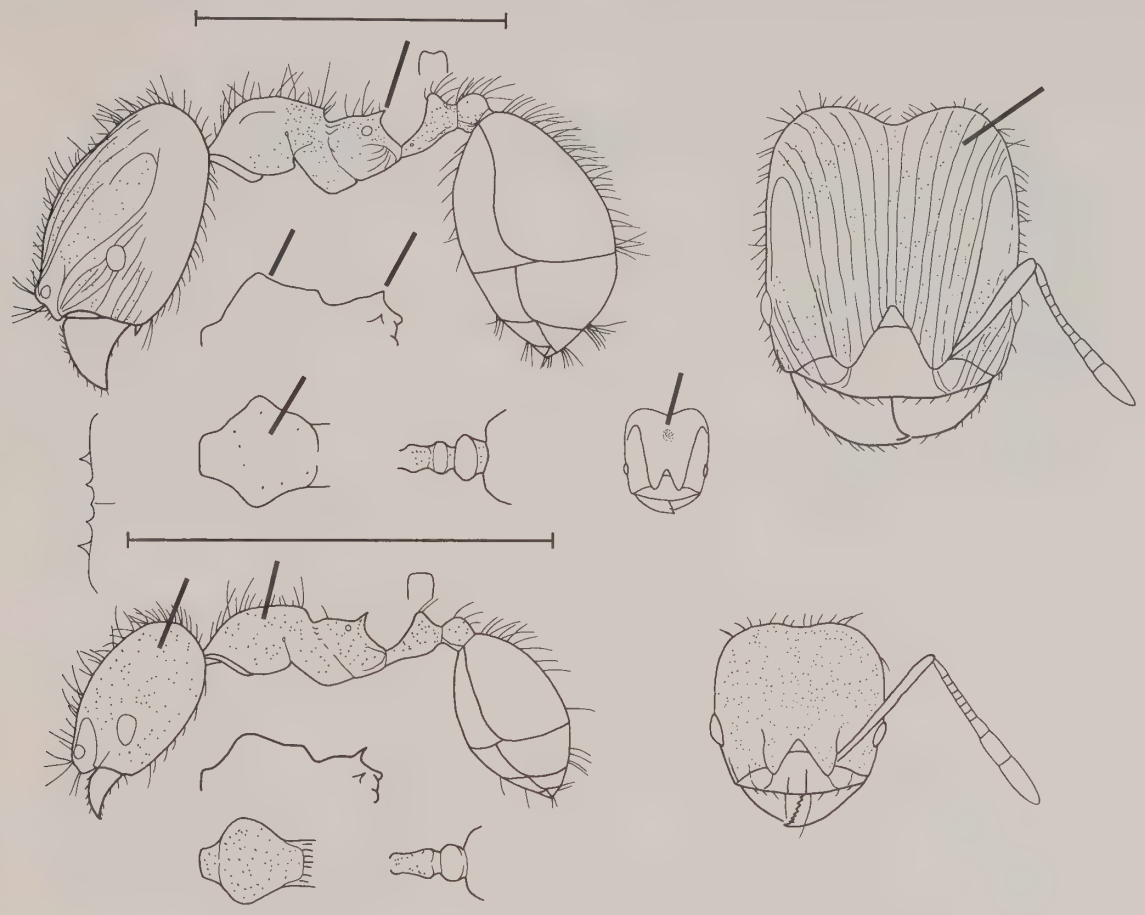
MEASUREMENTS (mm) Holotype major: HW 0.52, HL 0.60, SL 0.26, EL 0.06, PW 0.30.
Paratype minor: HW 0.32, HL 0.34, SL 0.24, EL 0.04, PW 0.22.

COLOR Major and minor: yellow.

RANGE Known from the type locality; from near Belém, Pará, Brazil; and from Tingo Maria, Amazonian Peru.

BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. GUYANA: Kartabo (William M. Wheeler). Scale bars = 1 mm.

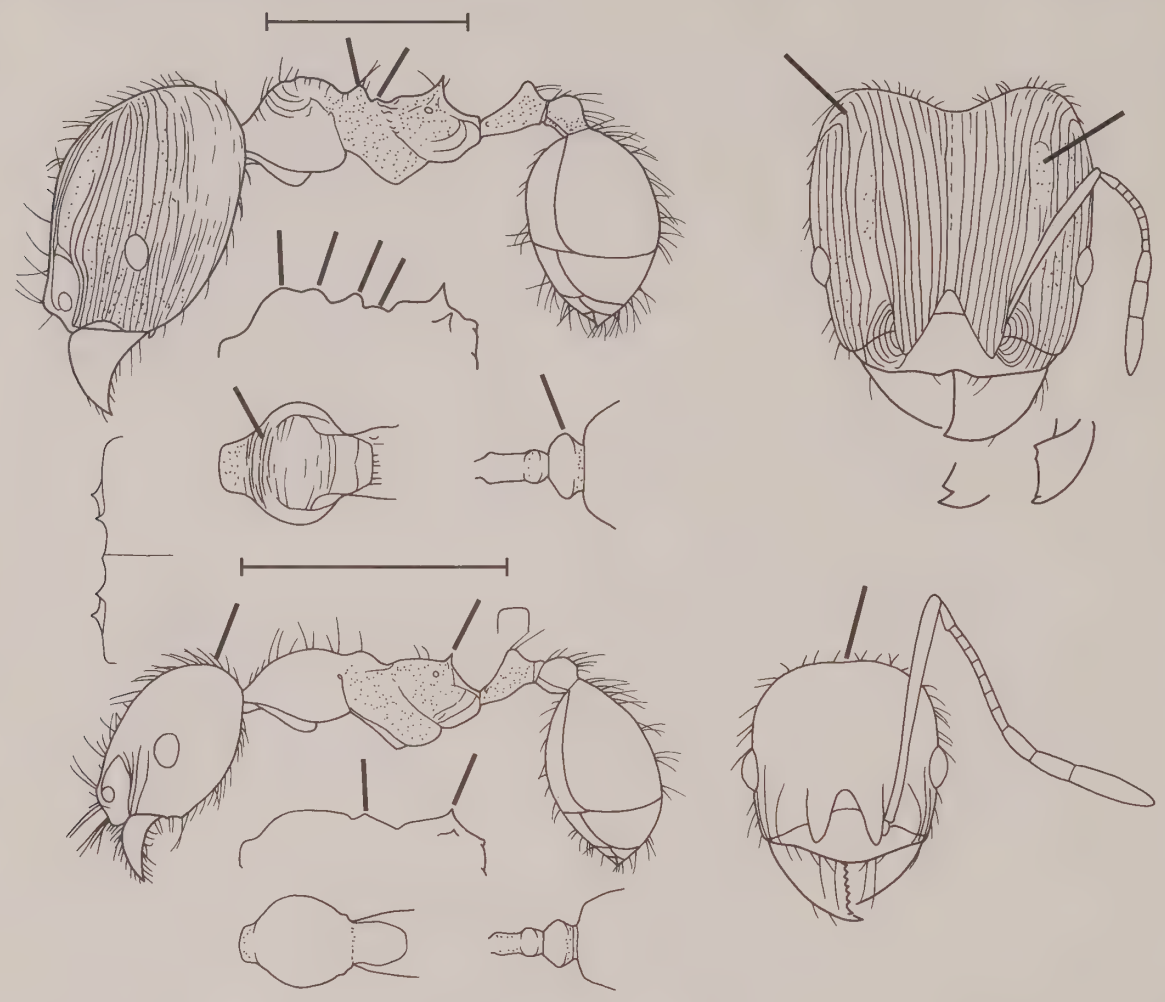


Pheidole tachigaliae Wheeler

Pheidole tachigaliae Wheeler 1921f: 148.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *tachigaliae,* referring to the plant on which the type colony was found.
DIAGNOSIS A member of the *tachigaliae* group, characterized by very small size and 11-segmented antennae, this species is easily recognized by the following traits.
Major: dorsal surface of head longitudinally carinulate (not transversely carinulate as in other *tachigaliae*-group species); pronotal dorsum lightly sprinkled with foveolae, feebly shiny; propodeal spines short, stout and directed strongly backward.
Minor: all of head and mesosoma foveolate and opaque.
MEASUREMENTS (mm) Lectotype major: HW 0.64, HL 0.74, SL 0.32, EL 0.08, PW 0.40.
Paralectotype minor: HW 0.34, HL 0.38, SL 0.28, EL 0.08, PW 0.22.
COLOR Major: concolorous medium yellow; vertex with a fuzzy, circular brown spot as illustrated.
Minor: concolorous pale yellow.
RANGE Known from the type locality and from Kaw, French Guiana (Mark W. Moffett).
BIOLOGY Found on the ant-plant *Tachigalia*.

FIGURE Upper: major. Lower: minor. CUBA: Hotel Telegrafo, Holguin, Oriente (lectotype and paralectotype of *P. teneriffana* subsp. *taina* Aguayo). (Type locality: Tenerife, Canary Islands.) Also, see excellent figure by Snelling (1992b). Scale bars = 1 mm.

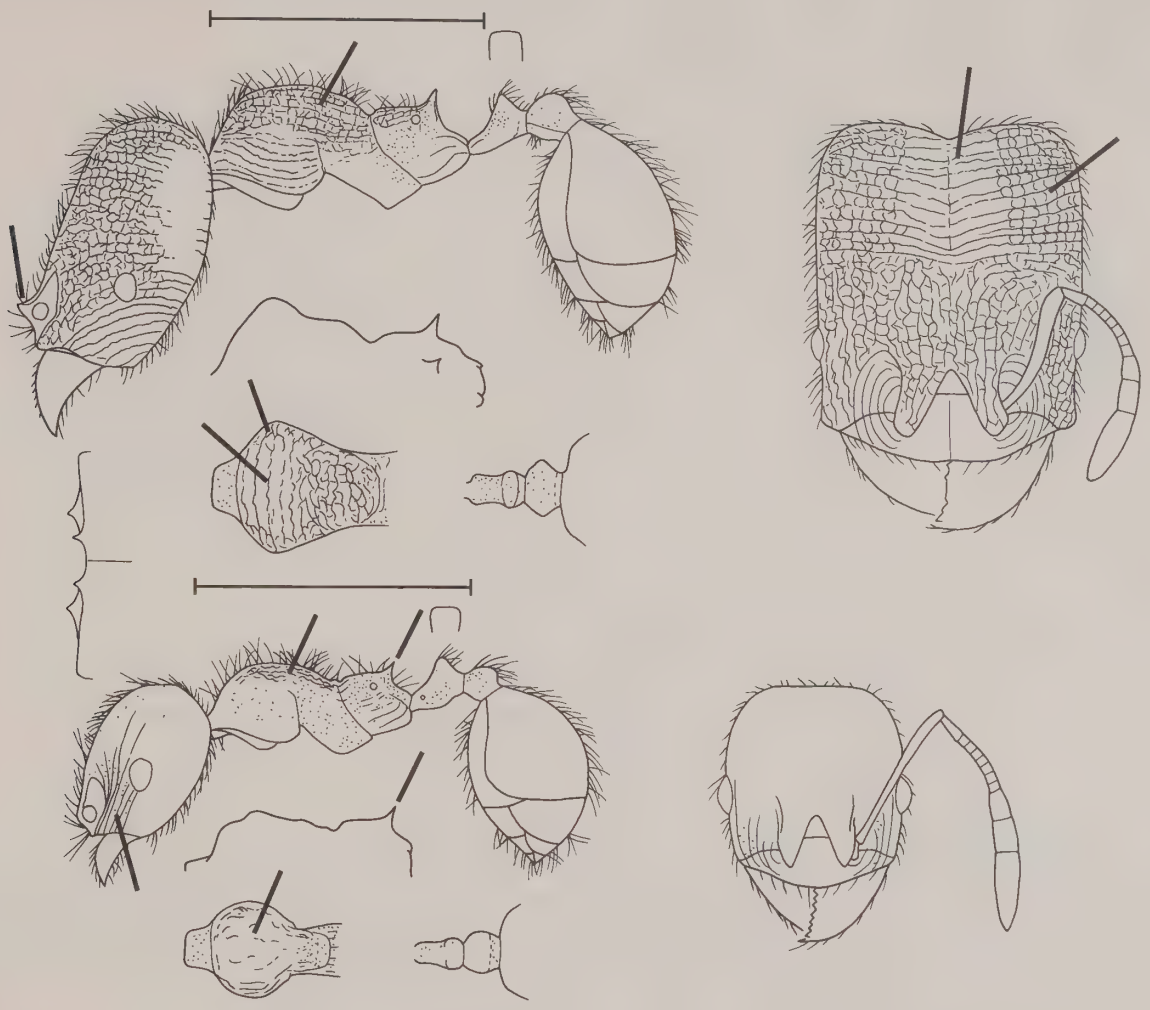


Pheidole teneriffana Forel

Pheidole teneriffana Forel 1893f: 465. Syn.: *Pheidole teneriffana* subsp. *taina* Aguayo 1932: 219.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY Named after the place of origin of the types.
DIAGNOSIS **Major**: unique in the possession of a broad, convex metanotum and a four-lobed mesosomal profile in dorsal-oblique view (2 on pronotum, one each on mesonotum and metanotum); also, presence of a weak antennal scrobe; carinulae cover all the dorsal head surface except for the frontal triangle and midclypeus; carinulae originating laterad to antennal scrobes circle outward and downward again to travel to the eye and behind it; postpetiole elliptical from above.
Minor: occiput slightly narrowed, no nuchal collar.
MEASUREMENTS (mm) Major (Oriente, Cuba): HW 1.34, HL 1.34, SL 0.82, EL 0.20, PW 0.64.
Minor (Oriente, Cuba): HW 0.62, HL 0.70, SL 0.74, EL 0.14, PW 0.34.
COLOR Major and minor: light yellowish brown, with head, mandibles, and gaster a slightly darker shade.
RANGE Canary Islands and Mediterranean area. I have examined series from Egypt and Malta. The species, in addition to Aguayo's hotel series from Cuba, has been discovered by Michael J. Martinez (1992) in Admiral Kidd Park in western Long Beach, California. Another collection was made at Lima, Peru, by M. Pacheco, in 1991. The true origin of this tramp species is unknown, but the best guess is the Mediterranean region.
BIOLOGY In 1989 Martinez (1992) found a population occupying about two hectares of Admiral Kidd Park, evidently consisting of a single continuous, polydomous colony. The separate nests contained large numbers of workers and multiple inseminated queens, as many as 23 in one instance. Nest sites included lawns and open ground, where nest entrances were surmounted by mounds of excavated soil; crevices of sidewalks and curbs; and the bases of trees. New nest sites were occupied by budding from occupied sites. The workers were aggressive toward other ant species; they preyed on insects and harvested seeds. By 1998, according to Gulmahamad and Martinez (1999), the population was extinct. It had been weakened by attempts to exterminate it and changes in the nest habitat, and given the *coup de grâce* by encroaching Argentine ants *(Linepithema humile)*.

FIGURE Upper: lectotype, major (Bugaba, Panama). Lower: minor (Finca Loma Linda, near Agua Buena, Puntarenas, Costa Rica, J. Vandermeer). Scale bars = 1 mm.



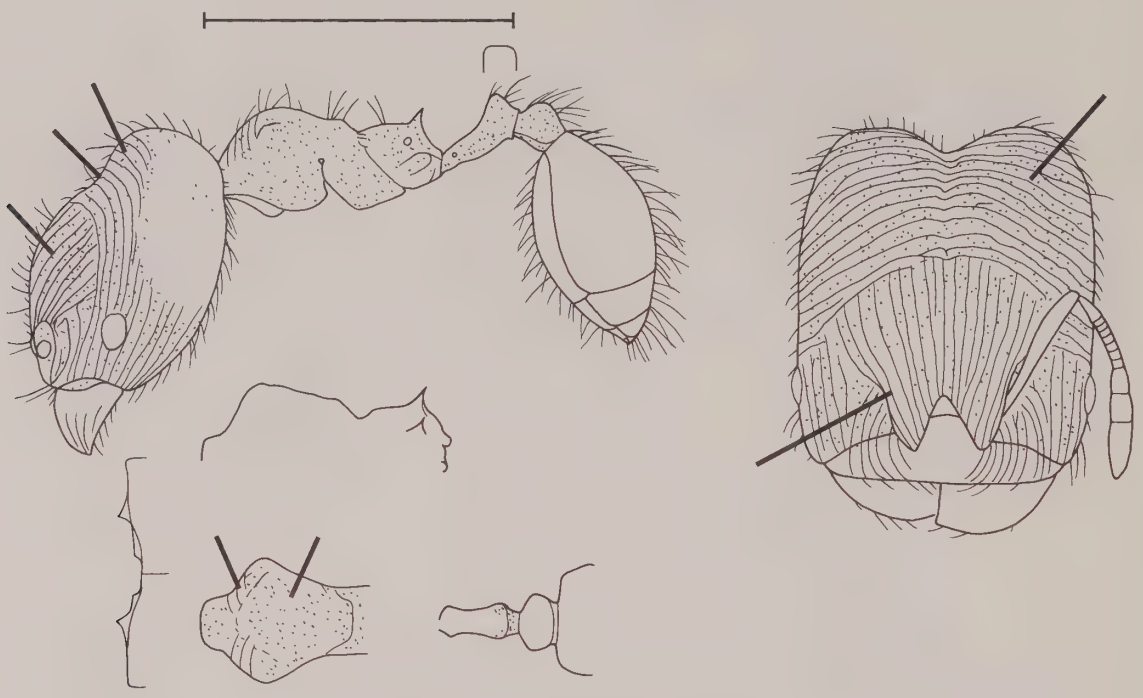
Pheidole bicornis Forel

Pheidole bicornis Forel 1899e: 74.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY L *bicornis,* two-horned, referring to the cornulate extensions of the frontal lobes of the major.
DIAGNOSIS A member of the *transversostriata* group and evidently close to the *tristis* group, easily distinguished by its small size; and in the **major** by the sharp, upturned horn-like extensions of the frontal lobes and heavy rugoreticulate dorsum of the head, broken in the central posterior region by a ladder-like sequence of parallel transverse carinae.
MEASUREMENTS (mm) Lectotype major: HW 0.86, HL 1.08, SL 0.38, EL 0.12, PW 0.54.
Minor (San Vito, Costa Rica): HW 0.48, HL 0.54, SL 0.42, EL 0.08, PW 0.32.
COLOR Major: concolorous light reddish brown.
Minor: concolorous yellow.
RANGE Costa Rica, Panama. In Costa Rica the species has been found in both the Atlantic and Pacific lowlands (Longino 1997) and to an elevation of 1270 m (Risch et al. 1977).
BIOLOGY In Costa Rica at least, *P. bicornis* is an obligate inhabitant of species of understory rainforest shrubs of the genus *Piper*. The ants live in cavities of the petioles and stems that they hollow out themselves. The relationship appears to be mutualistic: the workers, which seldom forage on the ground, feed on lipid-rich food bodies developing within the petiolar cavities. For their part the plants evidently benefit from the removal of the eggs and early stages of herbivorous insects (Letourneau 1983), as well as from the clearing of vines and transport of organic material into the plant by the ants during nest construction (Risch et al. 1977).

Compare with *scolioceps*

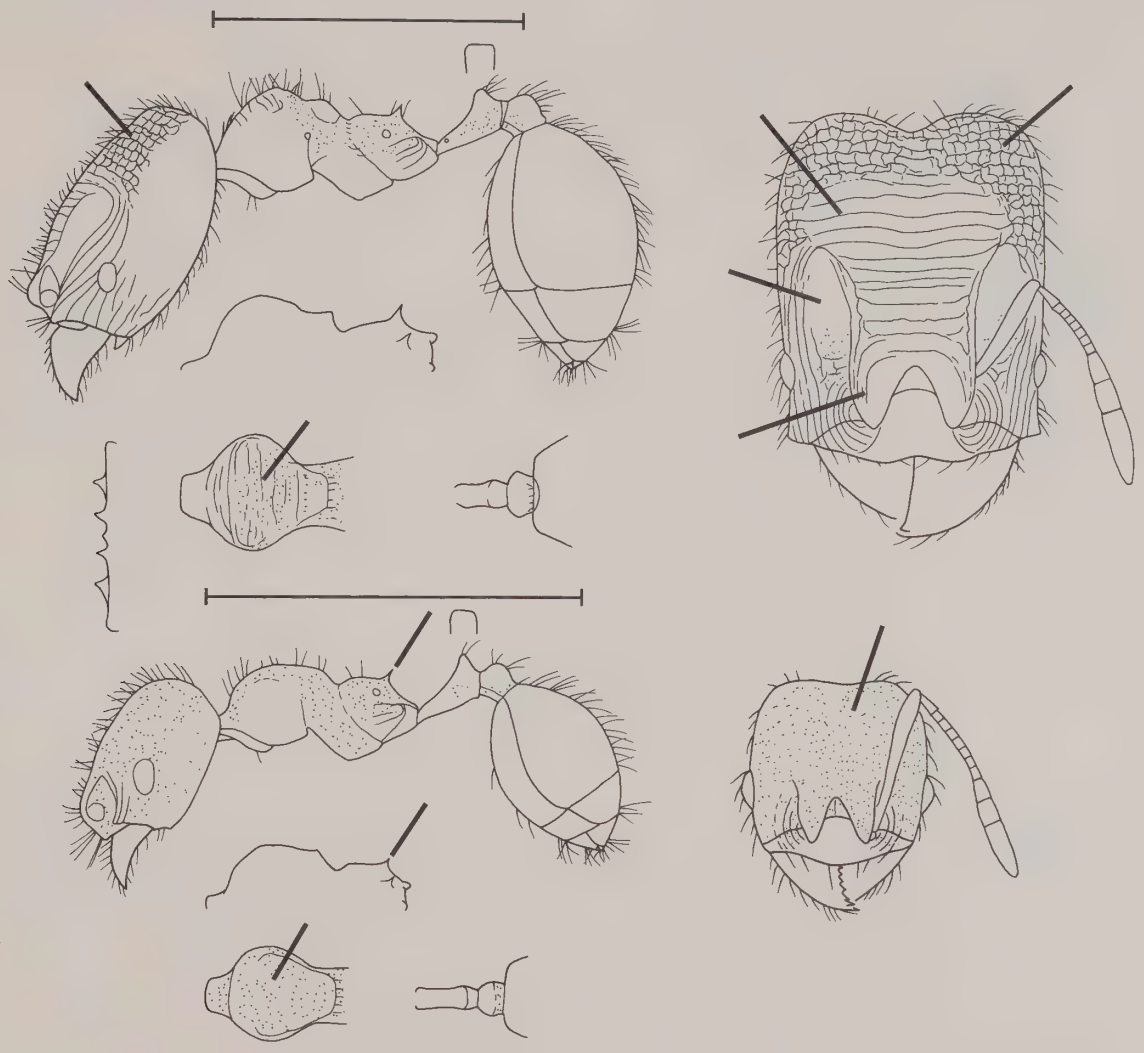
FIGURE Holotype, major. ECUADOR: Pichincha, 3 km from Tandari, 1300 m (Stewart B. and Jarmila Kukalová-Peck). Scale bar = 1 mm.



Pheidole gnomus **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY NL *gnomus,* dwarf.
DIAGNOSIS A member of the *transversostriata* group, close to *scolioceps,* distinguished in the **major** by the broad band of transverse carinulae that cover the posterior half of the head, curving forward, with the most anterior carinulae ending at the eyes. Also in the major, the pronotum completely foveolate and opaque, with the anterior dorsal margins of the pronotum transversely carinulate.
MEASUREMENTS (mm) Holotype major: HW 0.84, HL 1.00, SL 0.44, EL 0.16, PW 0.44.
COLOR Major: body concolorous medium brown.
RANGE Known only from the type locality.
BIOLOGY The types were collected from a forested mountain ravine.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (Stefan Cover). Scale bars = 1 mm.



Pheidole scalaris **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *scalaris,* of a ladder, alluding to the strong ladder-like pattern on the dorsum of the major head.

DIAGNOSIS Close to *transversostriata* but distinguished from it and other members of the *transversostriata* group by the broad occipital zone of rugoreticulum on the dorsal surface of the head of the **major**, surmounting a wide "ladder" of parallel transverse carinulae that reach the frontal lobes, where they curve anteriorly to the ends of the lobes; also, the promesonotal dorsum is completely covered by transverse carinulae. Also, see the distinctive color of the **minor** (below).

This species is possibly synonymous with *P. transversostriata* var. *nigridens* Forel of Colombia, which has been provisionally synonymized with *transversostriata*; *nigridens* has rugoreticula on the occipital corners and more carinulae on the pronotal dorsum, and is intermediate between *scalaris* and *transversostriata*. However, *scalaris* also differs from *transversostriata* by the more elongate head of the **major** (Head Length 1.3× Head Width versus 1.2× in *transversostriata*) and smooth sides of the pronotum of the **minor**.

MEASUREMENTS (mm) Holotype major: HW 0.64, HL 0.84, SL 0.32, EL 0.10, PW 0.36.
Paratype minor: HW 0.42, HL 0.46, SL 0.36, EL 0.08, PW 0.26.

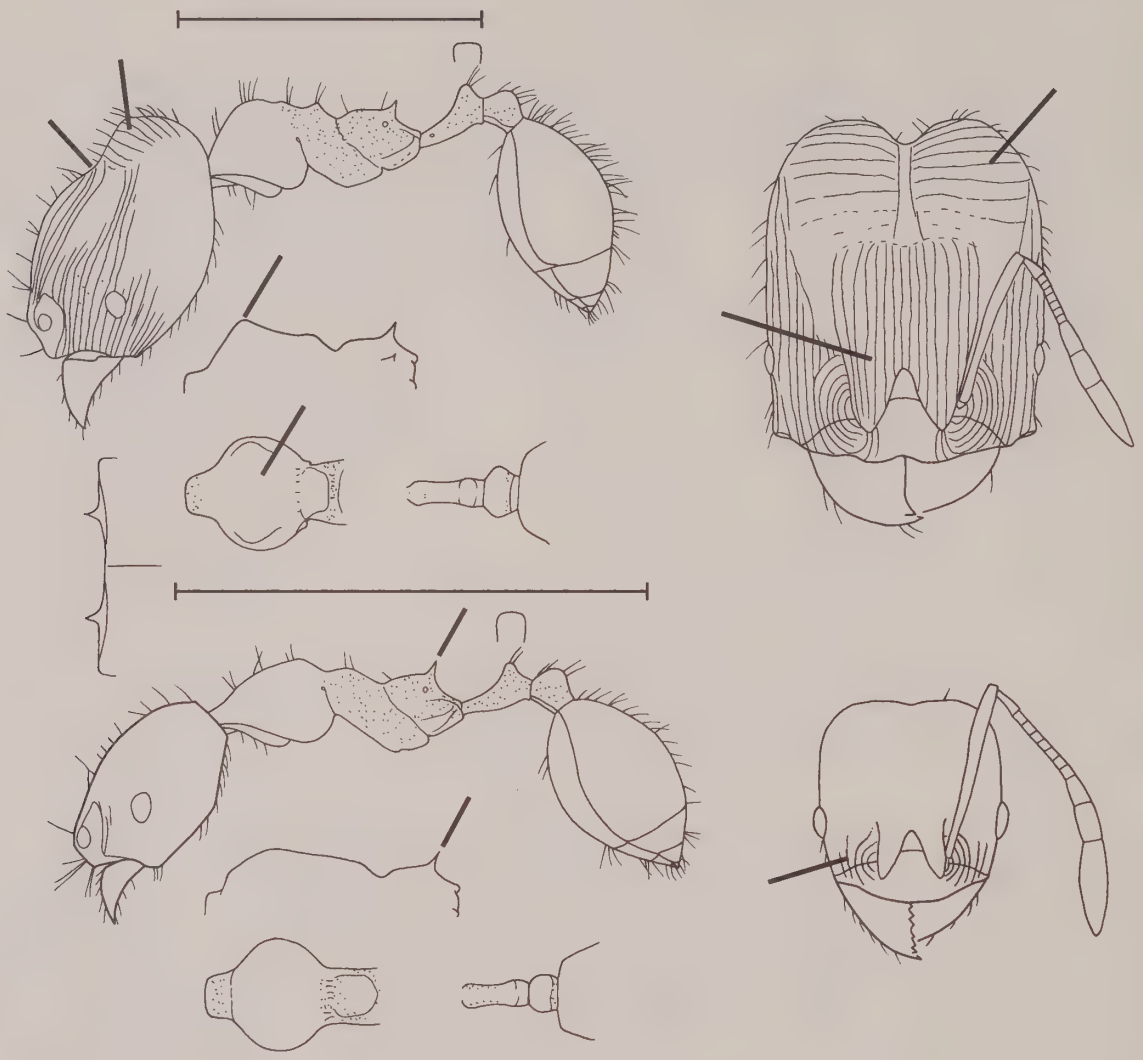
COLOR Major: concolorous medium yellow.
Minor: overall light brownish yellow, with medium brown vertex, occiput, and dorsum of promesonotum, and medium yellow appendages.

RANGE Atlantic and northern Pacific lowlands of Costa Rica; and Arima Valley, Trinidad.

BIOLOGY Longino (1997) found *P. scalaris* in both seasonal dry forest and evergreen forest. The workers were recruited to baits on the forest floor.

Compare with *gnomus*

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios (Stefan Cover). Scale bars = 1 mm.



Pheidole scolioceps **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *scolioceps,* bent head, alluding to dorsal profile of major.

DIAGNOSIS A member of the *transversostriata* group, closest to *gnomus* of Ecuador, distinguished in the **major** by the broad swath of transverse carinulae covering the posterior third of the head, but unlike those of *gnomus,* they are less extensive and do not curve downward to the sides; also, the pronotum is completely smooth and shiny and lacks anterior carinulae.

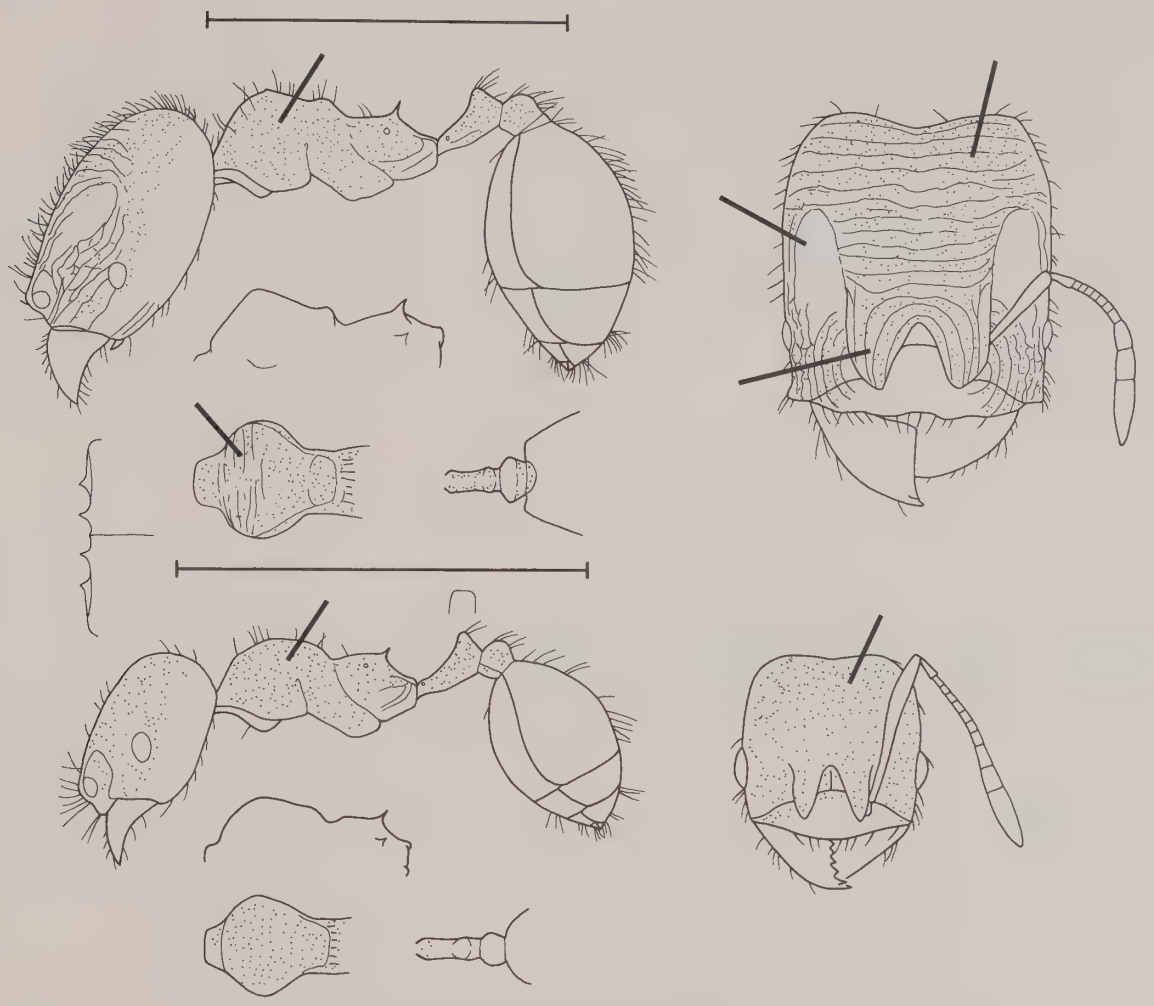
MEASUREMENTS (mm) Holotype major: HW 0.72, HL 0.88, SL 0.40, EL 0.10, PW 0.34.
Paratype minor: HW 0.38, HL 0.44, SL 0.40, EL 0.06, PW 0.24.

COLOR Major and minor: concolorous clear medium yellow.

RANGE Known from the type locality and from the Pirelli Plantation (Iriboca), near Belém, Pará, Brazil (P. F. Darlington).

BIOLOGY At the type locality, Stefan Cover and John E. Tobin found five colonies in terra firme forest and woodland transitional to seasonally flooded forest, nesting variously in clay soil and, in one instance, a hollow rotten stick on the forest floor.

FIGURE Upper: major (syntype of synonymous *P. lacerta* Wheeler, Port of Spain, Trinidad, compared with unique holotype of *P. transversostriata*). Lower: minor (Inner Brass, St. Thomas, Virgin Islands, associated with major compared with *transversostriata* holotype). (Type locality: Guianas.) Scale bars = 1 mm.



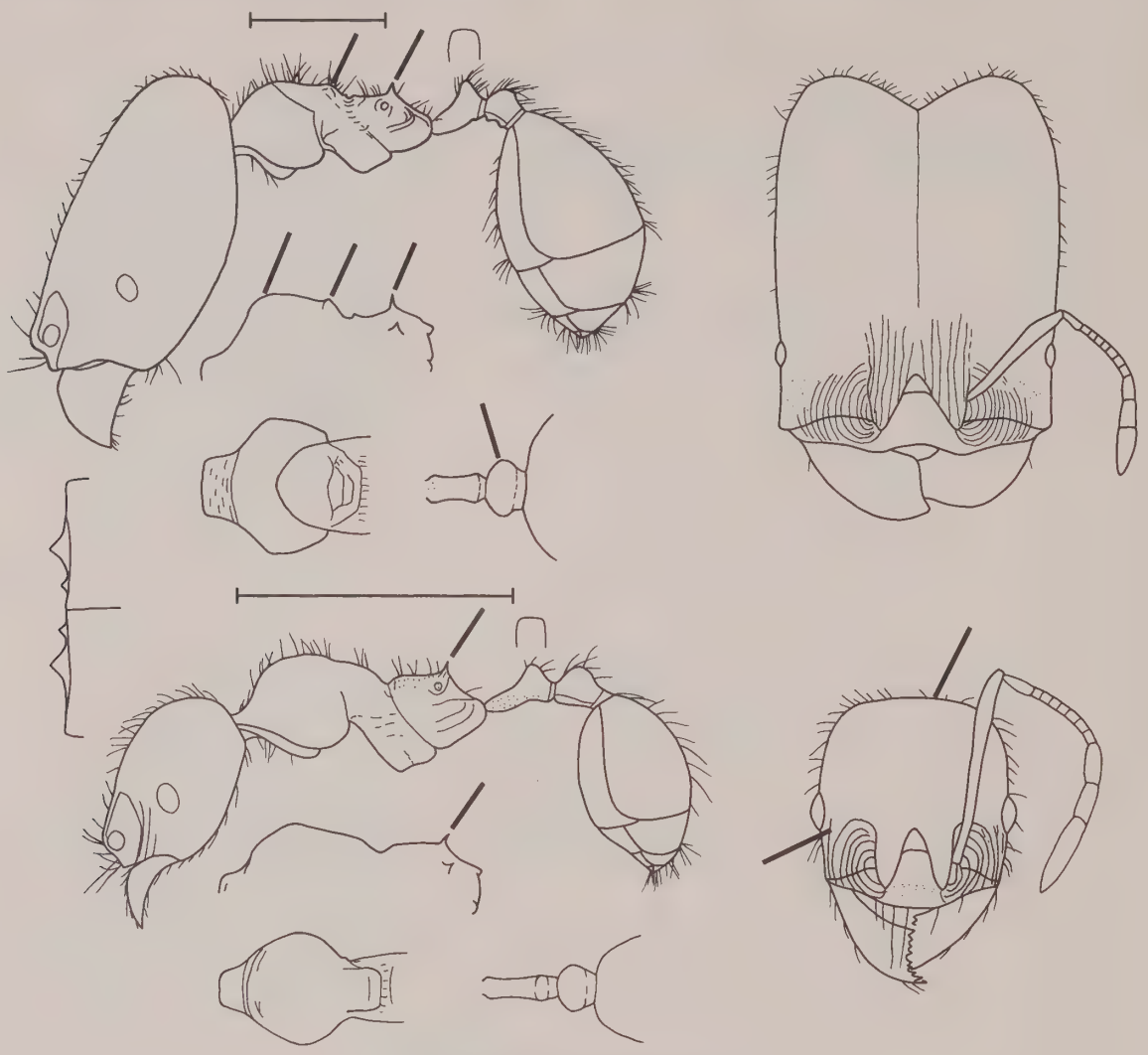
Pheidole transversostriata Mayr

Pheidole transversostriata Mayr 1887: 584. Syn.: *Pheidole transversostriata* var. *nigridens* Forel 1901j: 362, n. syn.; *Pheidole lacerta* Wheeler 1922e: 6, n. syn. Possible synonym: *Pheidole scalaris* new species, this monograph. Raised to species level in this monograph and placed in the *tachigaliae* group: *gibbata*.

TYPES Naturhist. Mus. Wien.
ETYMOLOGY L *transversostriata,* transversely lined, referring to the transverse carinulae of the major head.
DIAGNOSIS A member of the *transversostriata* group distinguished in the **major** by the broad ladder-like array of transverse carinae that extend unbroken from the occiput to the frontal lobes where they curve anteriorly to the ends of the lobes. It is close to *scalaris* of Costa Rica, differing in the **major** in the lack of rugoreticulum on the occiput (completely reticulate in *scalaris*) and less elongate head (Head Length 1.2× Head Width versus Head Length 1.3× Head Width in *scalaris*), and in the **minor** by the completely foveolate sides of the pronotum (versus smooth and shiny in *scalaris*). However, a major syntype of *transversostriata* "var. *nigridens*" from Colombia has the corners of the occiput rugoreticulate and is thus intermediate between *transversostriata* and *scalaris* in this character. The two forms may prove to be geographic variants (or good species) when more material becomes available.
MEASUREMENTS (mm) Unique holotype major: HW 0.66, HL 0.80, SL 0.34, EL 0.10, PW 0.36.
Minor (St. Thomas, Virgin Islands): HW 0.40, HL 0.44, SL 0.36, EL 0.06, PW 0.26.
COLOR Major: medium yellowish brown, with head a shade lighter and gaster a shade darker than mesosoma and waist.
Minor: concolorous yellowish brown, legs clear yellow.
RANGE *P. transversostriata* is evidently a wide-ranging but locally uncommon species, known from scattered records from St. Thomas, Virgin Islands, and Trinidad (Port of Spain) to the Guianas, Colombia, and Rio de Janeiro and Santa Catarina, Brazil.
BIOLOGY Forel (1901j) collected the species from soil in Colombia.

Compare with *stulta*

FIGURE Upper: major. The body is drawn from a specimen from 10 km east of Campeche, Mexico (E. O. Wilson), compared with the lectotype major in Mus. Nat. Hist. Genève; the head is drawn from the lectotype major. Lower: paralectotype, minor. GUATEMALA: Retalhuleu. Scale bars = 1 mm.

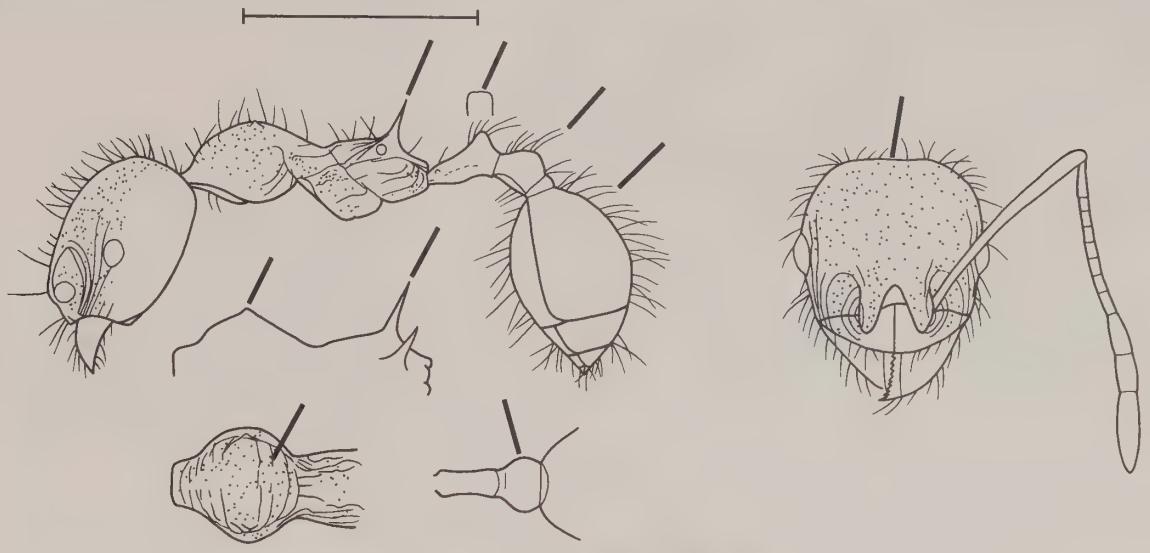


Pheidole absurda Forel

Pheidole absurda Forel 1886b: xlvii. Syn.: *Pheidole ridicula* Wheeler 1916i: 29, n. syn.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY L *absurda,* foolish, silly, referring to the very large, elongate head of the major.
DIAGNOSIS A large member of the *tristis* group distinguished by the disproportionately large, elongate head of the **major**. The **major** is also characterized by a nearly complete lack of sculpturing on the head and body other than carinulae found on the dorsal surface of the head from the level of the eyes forward; very low mesosomal convexity; propodeal spines small and erect.
Minor: occiput broad, lacking nuchal collar; body almost completely smooth, lacking any sculpturing except for carinulae on the dorsal head surface at the level of the eye and anterior to it.
MEASUREMENTS (mm) Lectotype major: HW 1.80, HL 2.38, SL 0.82, EL 0.24, PW 0.84.
Paralectotype minor: HW 0.64, HL 0.68, SL 0.64, EL 0.14, PW 0.42.
COLOR Major: head reddish yellow, mandibles medium reddish brown, rest of body and appendages yellowish brown.
Minor: body light brown, appendages brownish yellow.
RANGE The Brownsville area of extreme southern Texas south to Costa Rica. I have seen material from the Yucatán Peninsula and Guatemala. Kempf (1972b) reports *absurda* from the "Guianas," but this needs verification.
BIOLOGY Near Campeche I found a nest in moist clay of a thorn forest. Soil nests are also reported by Longino (1997) in Costa Rica and by Creighton (1966b) in Texas. According to Creighton, the nest entrance is an inconspicuous hole 2–5 mm in diameter, leading to a diffuse system of galleries and chambers that descend as much as a meter into the ground. A mature colony contains at least 75 majors and 300 minors. The colonies harvest seeds (*Amaranthus palmeri* at Creighton's study site) and store them in granary chambers. The minors strip the ovary shards away from the seeds, and the majors crack them open. The majors also serve as very effective guards, using their mandibles like wire clippers to chop off appendages of arthropod intruders. In observation nests they proved more than a match for other *Pheidole* and the native fire ant *Solenopsis geminata*.

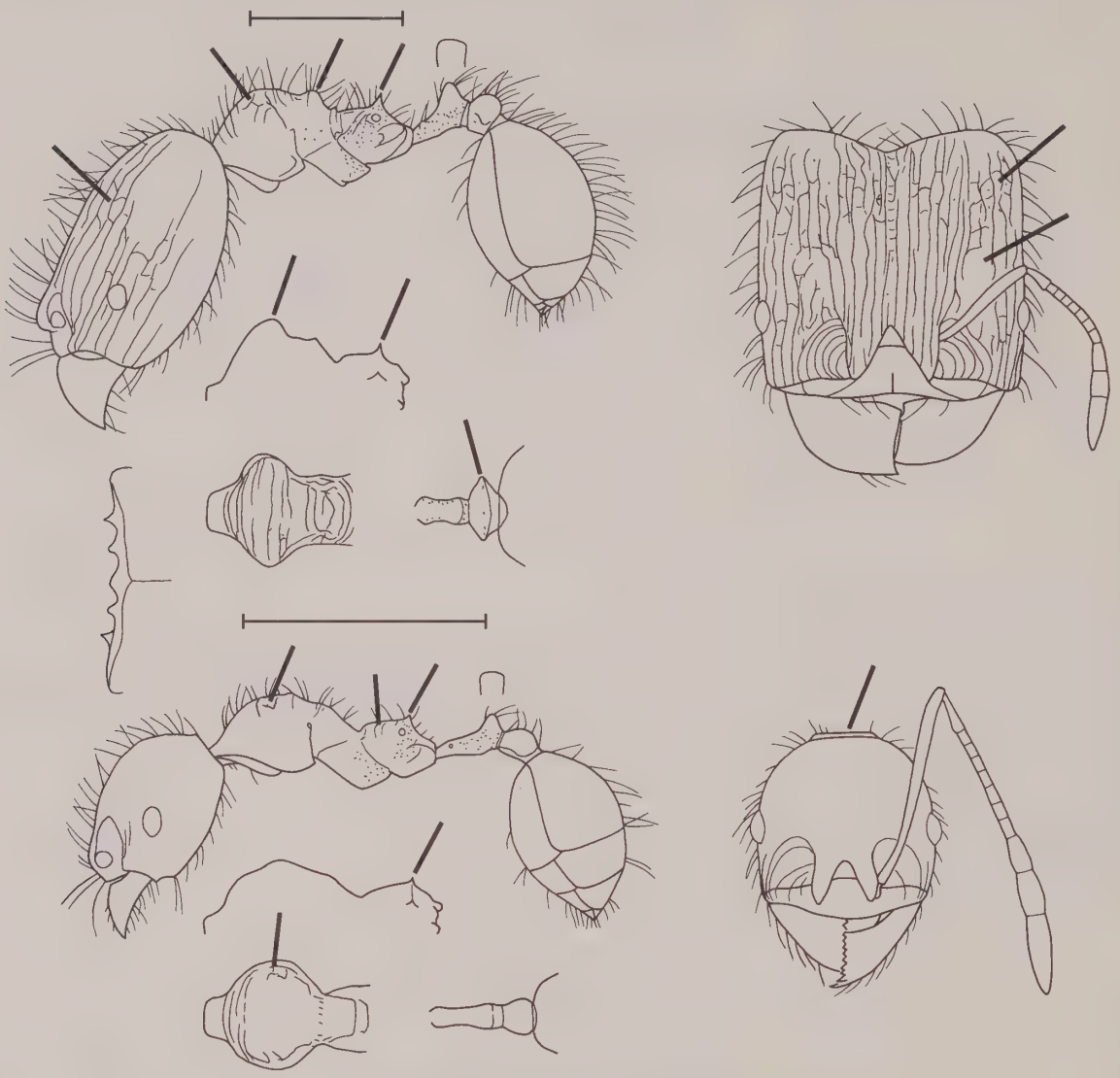
FIGURE Holotype, minor (major unknown). CUBA: La Gran Piedra (D. P. Alayo). Scale bar = 1 mm.



Pheidole alayoi **new species**

TYPES Mus. Comp. Zool. Harvard, courtesy of J. Fontenla.
ETYMOLOGY Named in honor of the collector, the Cuban entomologist D. P. Alayo.
DIAGNOSIS Holotype **minor** (major unknown): a medium-sized, yellow member of the *tristis* group, marked by its very long propodeal spines, subangulate humerus, bell-shaped postpetiole, long and dense pilosity, and completely foveolate and opaque dorsal surfaces of the head and mesosoma. Similar to the minor workers of *cubaensis, macromischoides,* and *naylae* of Cuba and *androsana* of the Bahamas, differing in details of body form, sculpturing, and pilosity, as shown, and by color.
MEASUREMENTS (mm) Holotype minor: HW 0.66, HL 0.78, SL 0.82, EL 0.12, PW 0.44.
COLOR Minor (major unknown): concolorous medium yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: Vigia, near Belém, Pará (William L. Brown). Scale bars = 1 mm.



Pheidole alexeter **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *alexeter,* guard, defender.

DIAGNOSIS A very distinct member of the *tristis* group distinguished by the following combination of traits.

Major: head short-rectangular; humerus very prominently lobose in dorsal-oblique view; mesonotal convexity prominent and symmetrical in side view; propodeal spines equilaterally triangular and directed perpendicular to basal propodeal face; postpetiole spinose from above; faint, shallow antennal scrobes present; posterior two-thirds of the dorsal surface of the head mostly covered by loose rugoreticulum; pronotal dorsum transversely carinulate and humeri bearing weak patches of rugoreticula.

Minor: occiput narrowed, with nuchal collar; propodeal spines reduced to denticles; humeri with loose rugoreticula; most of body smooth and shiny.

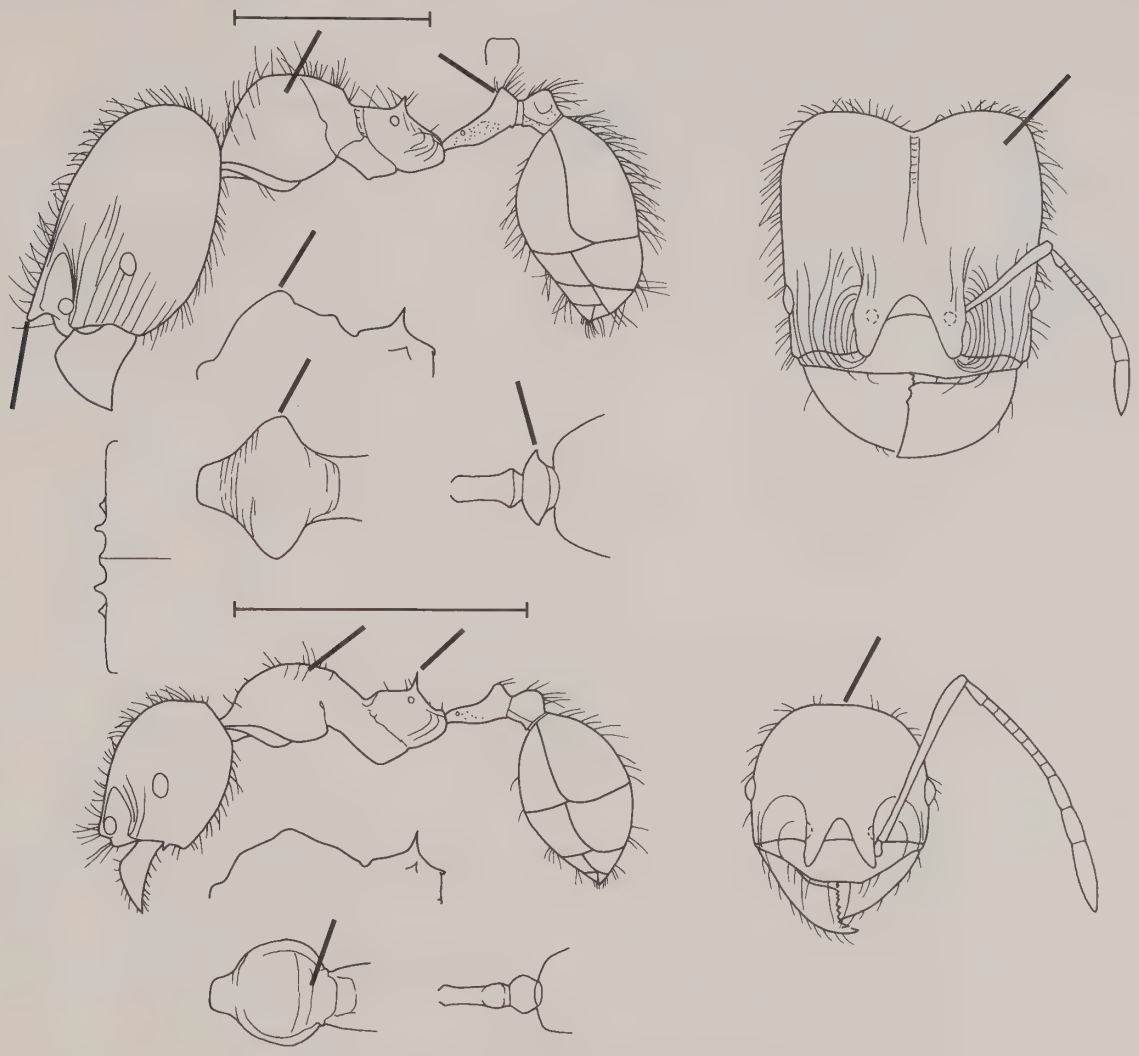
MEASUREMENTS (mm) Holotype major: HW 1.44, HL 1.54, SL 0.72, EL 0.16, PW 0.72.
Paratype minor: HW 0.62, HL 0.62, SL 0.66, EL 0.10, PW 0.40.

COLOR Major: body, mandibles, and antennae rich medium reddish brown, legs dark yellow.
Minor: concolorous dark yellow.

RANGE Known only from the type locality.

BIOLOGY Collected in a savanna.

FIGURE Upper: holotype, major. Lower: paratype minor. BRAZIL: Pirelli Plantation (Iriboca), near Belém, Pará (P. F. Darlington). Scale bars = 1 mm.



Pheidole allarmata **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr, L *allarmata,* the "other one" bearing arms, referring to the species' similarity to *subarmata* and *synarmata.*

DIAGNOSIS Similar to *hasticeps, subarmata, synarmata,* and *triplex* (see also the somewhat less similar *rhytifera*), differing from these and other *Pheidole* by the following combination of traits.

Major: in side view the frontal lobe is elongated to form a forward-projecting, thin, spine-like lobe; humerus strongly developed as protuberant lobes; postpetiolar node spinose; head quadrate; rear half of head and almost all of body smooth and shiny.

Minor: occiput narrowed but lacking a nuchal collar; propodeal spine long, thin, and erect; head and body almost entirely smooth and shiny.

This is probably the series noted by W. L. Brown (1981: 526) as representing a species distinct from *subarmata.*

MEASUREMENTS (mm) Holotype major: HW 1.26, HL 1.28, SL 0.60, EL 0.12, PW 0.74.
Paratype minor: HW 0.56, HL 0.56, SL 0.60, EL 0.06, PW 0.36.

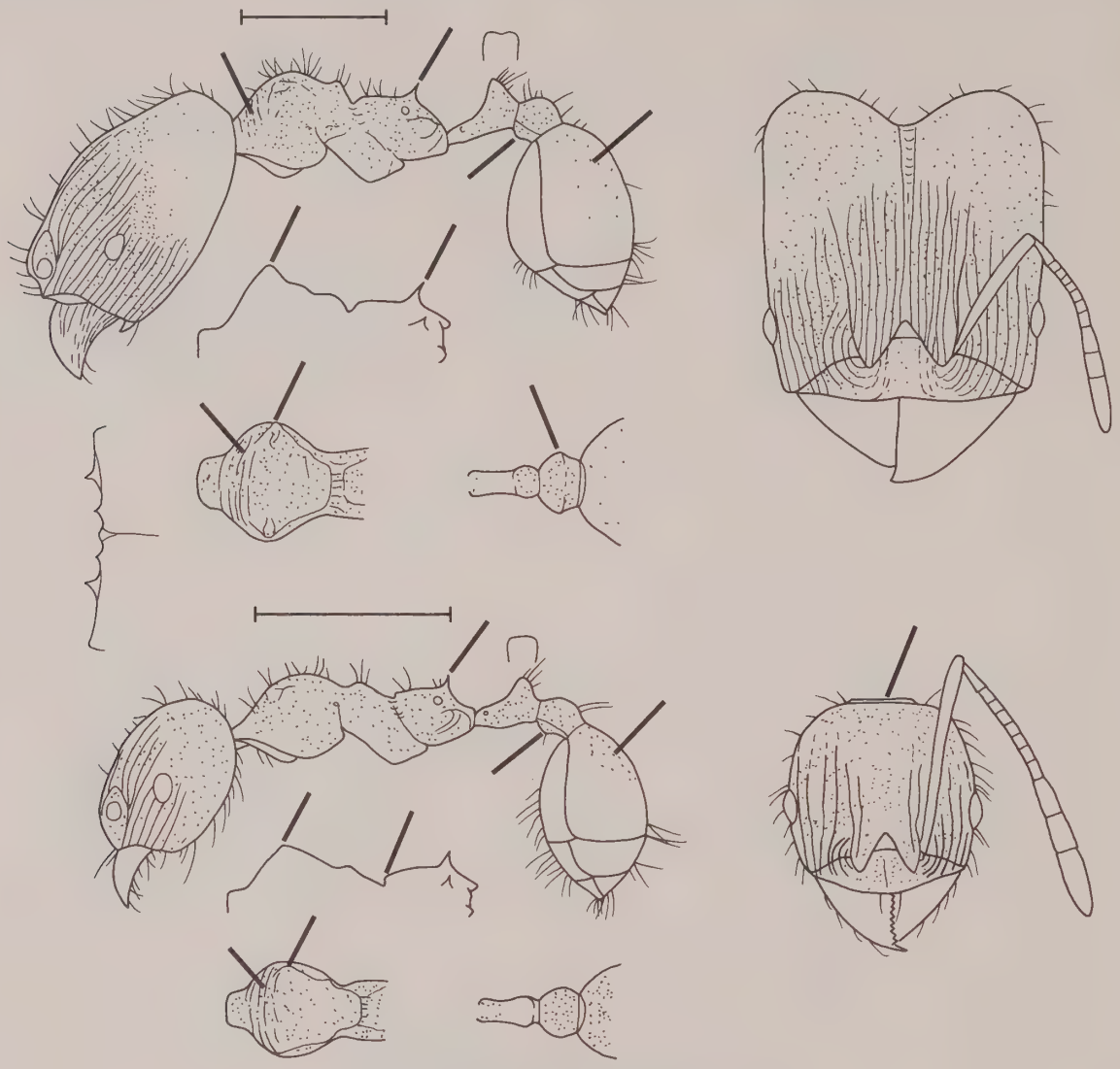
COLOR Major: head reddish brown, gradually deepening from light reddish brown at occiput to dark reddish brown on anterior half of head capsule and on mandibles; mesosoma medium reddish brown; waist, gaster, antennae, and legs light reddish brown.
Minor: concolorous yellow to dark brown.

RANGE An Amazonian species recorded from scattered localities in Brazil, Colombia, Ecuador, Peru, and Suriname.

BIOLOGY Two colonies collected by Stefan Cover and John E. Tobin at Cuzco Amazónico, Peru (Cover, collection notes) were in terra firme rainforest, nesting in rotten sticks on the forest floor. The colonies were small, with fewer than 100 workers and a single queen; one of the nests contained a seed cache.

Compare with species listed
in the Diagnosis below

FIGURE Upper: lectotype, major. Lower: paralectotype minor. BRAZIL: Colônia Alpina, Teresiópolis, Rio de Janeiro. Scale bars = 1 mm.

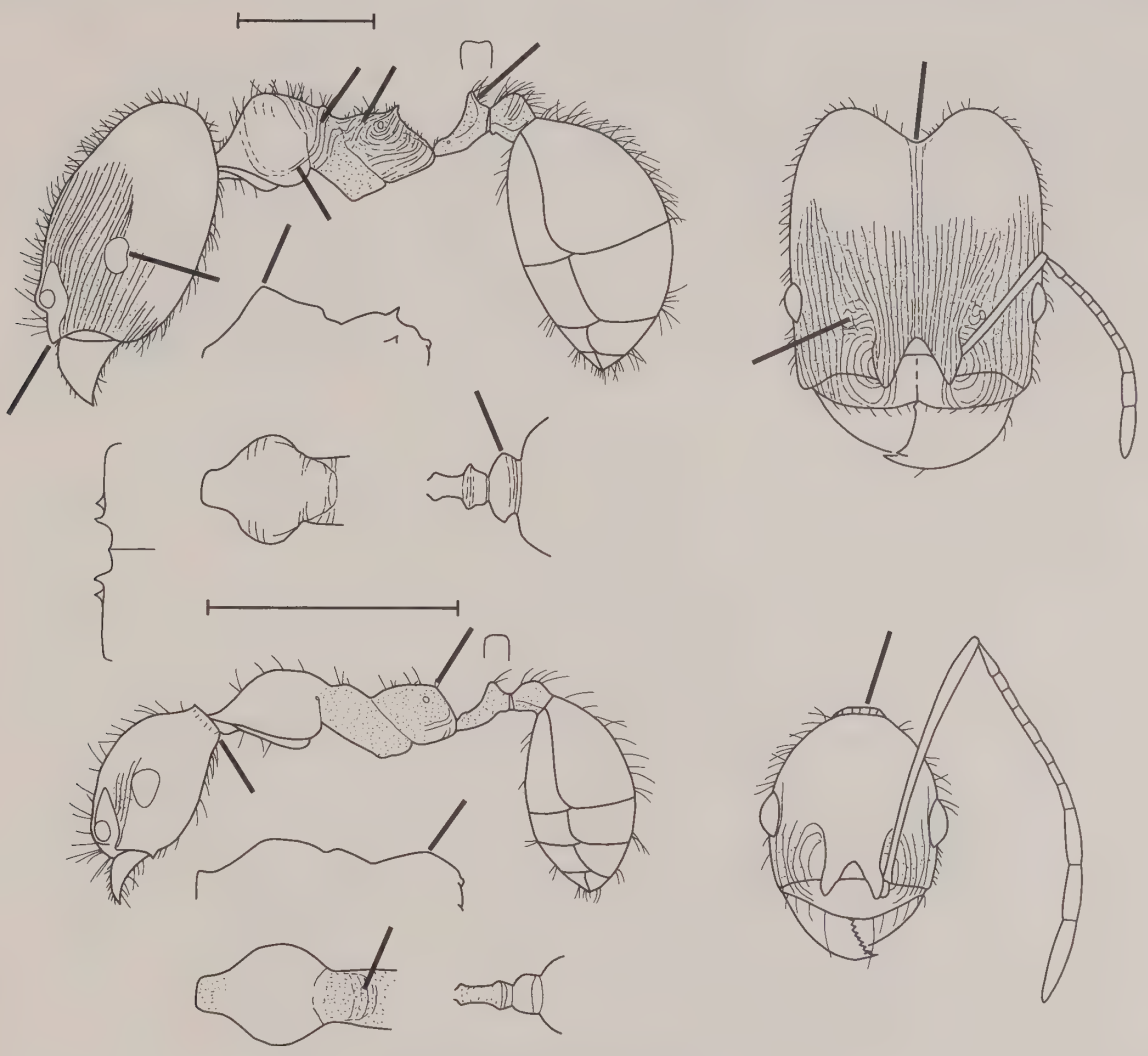


Pheidole alpinensis Forel, **new status**

Pheidole emeryi var. *alpinensis* Forel 1912g: 231.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY Named after the type locality.
DIAGNOSIS A large, reddish brown (**major**) or reddish yellow (**minor**) member of the *tristis* group with very prominent subangulate humeri, large subangulate postpetiolar node, small subpetiolar process, and weakly shagreened first gastral tergite, in both **major** and **minor**.
Close to *tristis,* and less similar to *alpinensis, exarata, excubitor, germaini, grantae, obrima, rogeri, stulta,* and *zoster,* differing in many details of body form, sculpturing, and pilosity, as illustrated, as well as in color.
MEASUREMENTS (mm) Lectotype major: HW 1.74, HL 2.00, SL 0.84, EL 0.20, PW 0.86.
Paralectotype minor: HW 0.76, HL 0.84, SL 0.80, EL 0.14, PW 0.48.
COLOR Major: concolorous reddish brown.
Minor: concolorous reddish yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. COLOMBIA: Ouriheka, near Rio Frio, Magdalena (Auguste Forel). Scale bars = 1 mm.

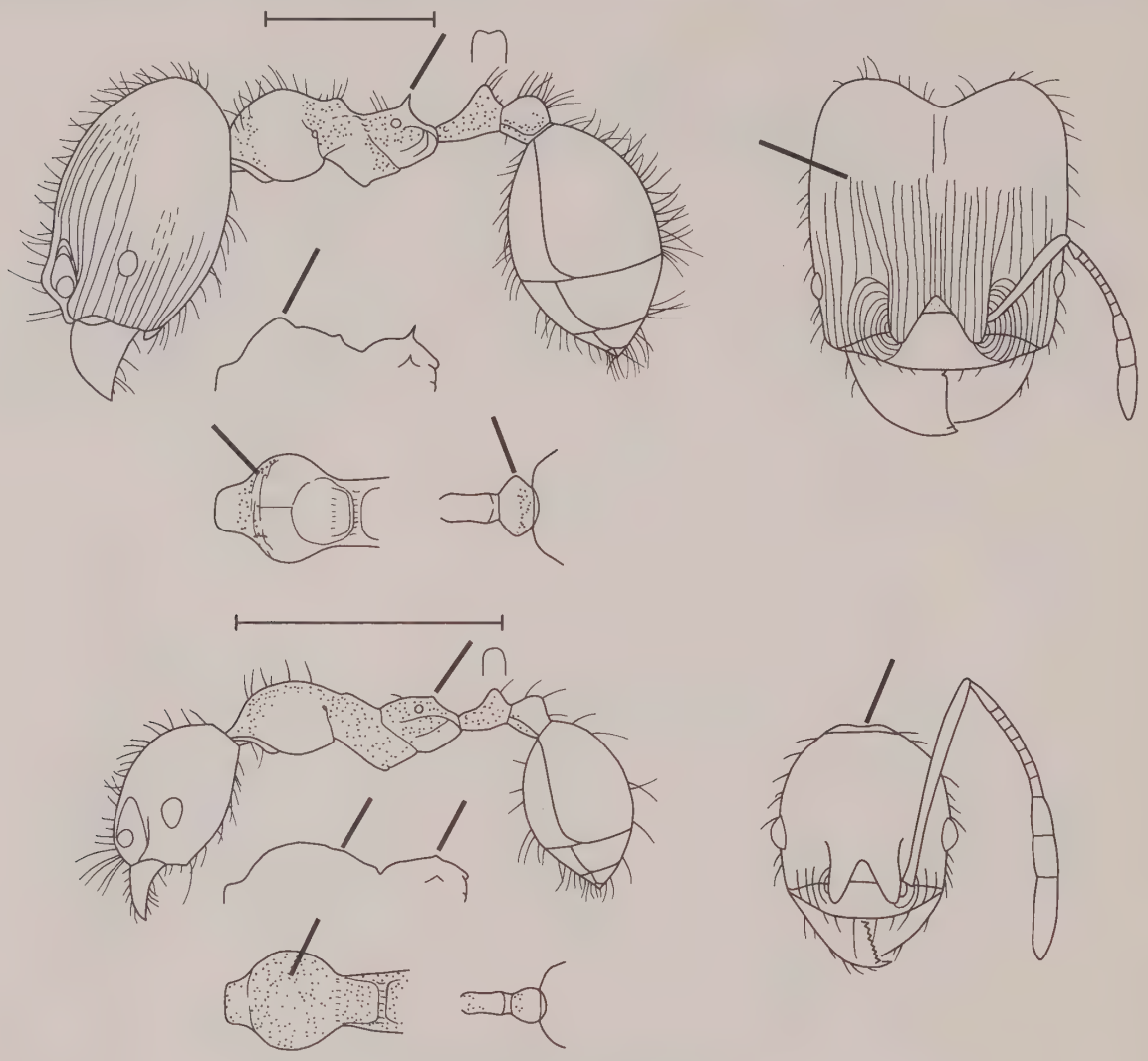


Pheidole amata Forel

Pheidole amata Forel 1901j: 360.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY L *amata,* loved passionately, reference unknown.
DIAGNOSIS Similar in various traits to *ambigua, celaena, fera, germaini, peruviana, rutilana, schwarzmaieri, superba,* and *vomer,* differing as follows.
Major: mostly reddish yellow; lower pronotal margin, upper half of mesopleuron, and sides of propodeum bearing curved carinulae, those on mesopleuron S-shaped; eye bean-shaped, with concave ventral border; clypeus prominent and long in side view but lacking any process; head subrectangular; occipital cleft deep; humerus in dorsal-oblique view prominent, subangulate; petiolar node thin in side view, and broad, elliptical, and marginally angular seen from above.
Minor: propodeal spine absent; occiput narrowed to a neck with nuchal collar; posterior half of mesonotum carinulate.
MEASUREMENTS (mm) Lectotype major: HW 1.54, HL 1.88, SL 0.82, EL 0.28, PW 0.80.
Paralectotype minor: HW 0.56, HL 0.74, SL 0.86, EL 0.10, PW 0.40.
COLOR Major: body reddish yellow except for gaster; which is plain medium brown; appendages reddish yellow.
Minor: body medium brown, verging to yellow at level of clypeus; appendages medium yellow.
RANGE Known only from the type locality.
BIOLOGY Forel discovered the type colony of *amata* in 1896 at the foot of the Sierra Nevada de Santa Marta, nesting in the soil of virgin rainforest.

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: Caraguatatuba Reserva Florestal, São Paulo (William L. and Doris E. Brown). Scale bars = 1 mm.



Pheidole ambigua **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *ambigua,* uncertain, doubtful.

DIAGNOSIS A medium-sized member of the *tristis* group, similar to *amata, celaena, fera, germaini, peruviana, rutilana, schwarzmaieri, vomer,* and possibly the same as *bruchi* of Argentina, on the basis of resemblance of the minor (major syntypes of *bruchi* could not be located in the Forel collection at the time of study). The paratype minor of *ambigua* differs from a syntype minor of *bruchi* in its more abundant pilosity, lighter color, and foveolate promesonotal dorsum. Otherwise, *ambigua* is distinguished within the *tristis* group by the following combination of traits.

Major: anterior two-thirds of dorsum of head carinulate, remainder smooth and shiny; carinulae on rest of body limited to anterior strip of pronotal dorsum; humerus in dorsal-oblique view moderately prominent and lobose; postpetiole from above diamond-shaped.

Minor: pilosity sparse; propodeal spines reduced to denticles; promesonotal profile in dorsal-oblique view smoothly convex; occiput narrowed, with a nuchal collar.

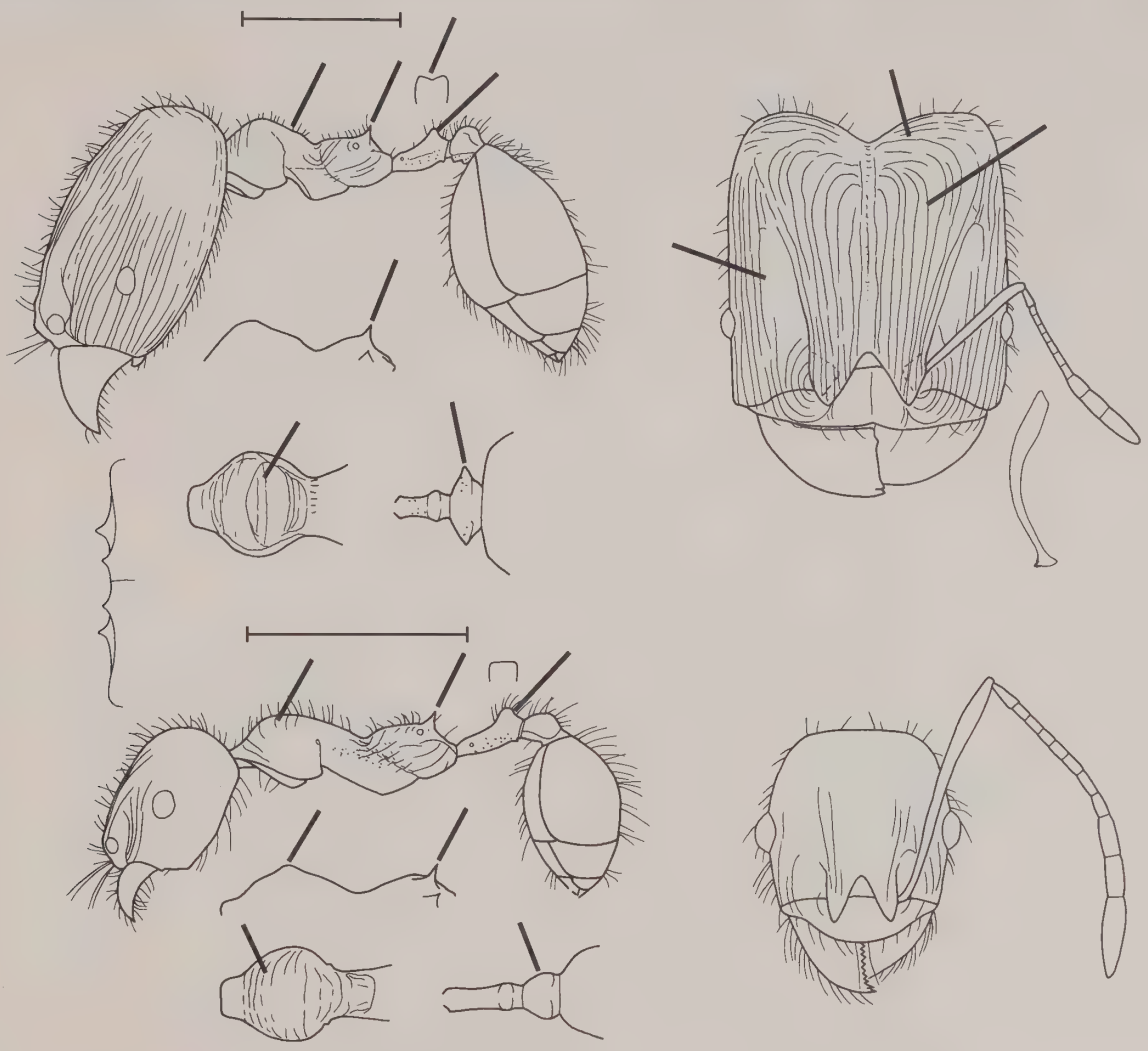
MEASUREMENTS (mm) Holotype major: HW 1.54, HL 1.74, SL 0.78, EL 0.18, PW 0.72.
Paratype minor: HW 0.56, HL 0.62, SL 0.74, EL 0.40, PW 0.36.

COLOR Major: light reddish yellow.
Minor: body light yellowish brown, appendages yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BAHAMAS: Andros Island. Scale bars = 1 mm.



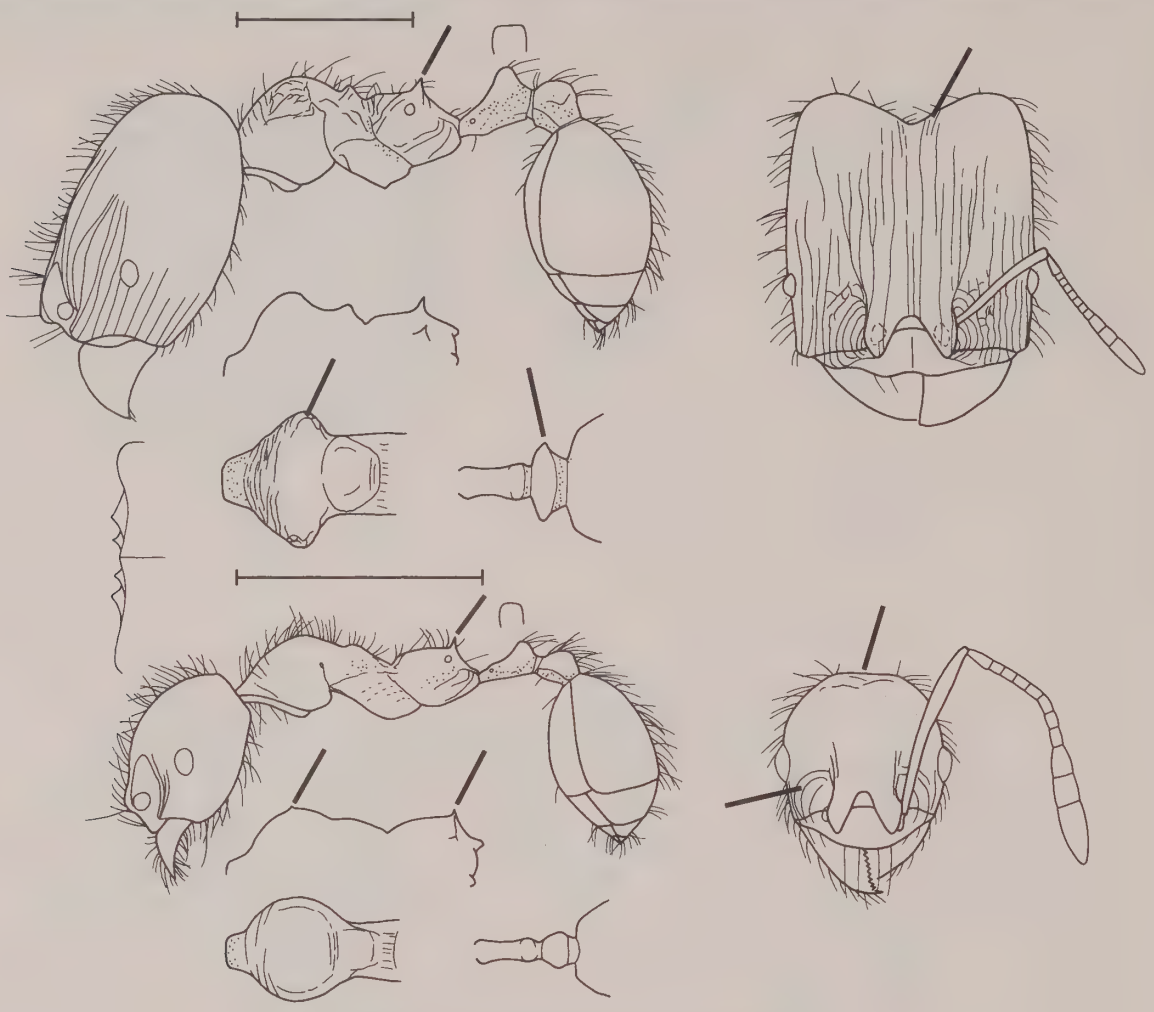
Pheidole androsana Wheeler

Pheidole androsana Wheeler 1905c: 90.

TYPES Amer. Mus. Nat. Hist.
ETYMOLOGY Named after the type locality.
DIAGNOSIS A medium-large, reddish yellow (major) or yellowish brown (minor) member of the *tristis* group.
Major: postpetiole carinulate; very low mesonotal convexity; shallow antennal scrobe; cephalic dorsum covered by carinulae that turn mesad near the occiput toward the midline to align themselves with the transverse carinulae of the occiput.
Minor: postpetiolar node bell-shaped; promesonotum covered by broken transverse carinulae; and mesonotal convexity absent.
Similar to *alayoi, cubaensis, macromischoides,* and *naylae* of Cuba, and to a lesser extent *ursus* of Mexico, differing in many details, as illustrated.
MEASUREMENTS (mm) Lectotype major: HW 1.64, HL 1.88, SL 0.86, EL 0.22, PW 0.74.
Paralectotype minor: HW 0.64, HL 0.72, SL 0.82, EL 0.14, PW 0.44.
COLOR Major: most of body medium reddish yellow ("orange"); gaster light yellowish brown; antennae and legs yellow.
Minor: body yellowish brown, appendages medium yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with species listed
in the Diagnosis below

FIGURE Upper: syntype, major. Lower: syntype, minor. ST. VINCENT: West Indies (H. H. Smith). Scale bars = 1 mm.

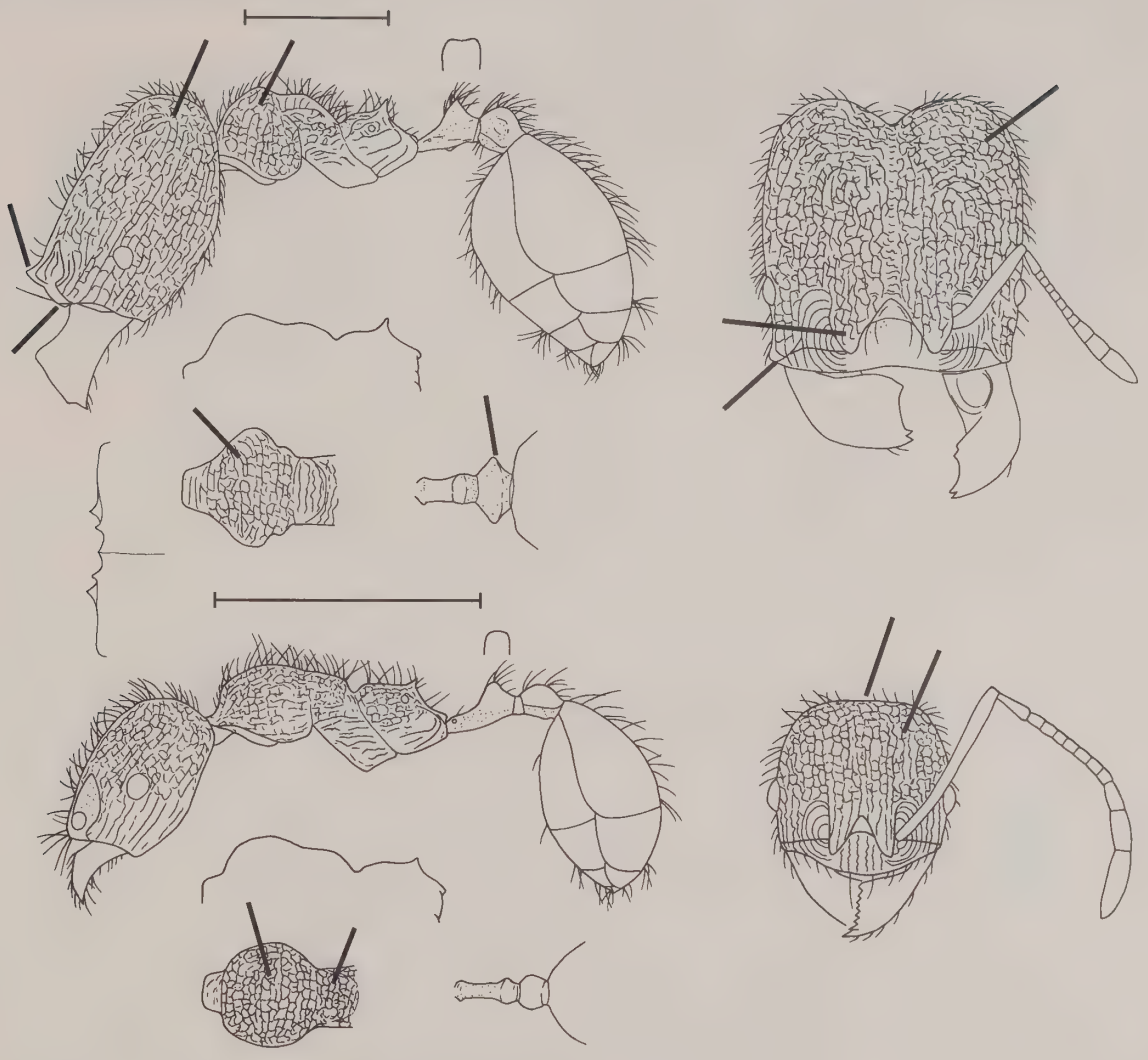


Pheidole antillana Forel, **new status**

Pheidole guilelmimuelleri subsp. *antillana* Forel 1893j: 401. Syn.: *Pheidole guilelmimuelleri* subsp. *antillana* var. *nigrescens* Forel 1893j: 404 (unavailable name).

TYPES Mus. Hist. Nat. Genève; Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the Antilles, the native region of the species.
DIAGNOSIS Similar to *avia, bucculenta, guilelmimuelleri, hetschkoi, heyeri, hortonae, praeses, rhytifera,* and *sarcina* of South America, as well as *mamore* of the *scrobifera* group, but differing in the following combination of traits.
Major: antennal scrobe absent; strong medium-length propodeal spines present; carinulae originating on the frontal lobes mostly approach or reach the occiput; intercarinular spaces of cephalic dorsum smooth and shiny; humerus rugoreticulate.
Minor: occiput narrow but lacking a nuchal collar; humerus denticulate in dorsal-oblique view; carinulae on head confined to area mesad and anterior to the eyes and several broken lines on the occiput; carinulae on pronotum sparse and limited to anterior margin. Color varies from yellow to dark brown, as part of geographic variation among different island populations.
MEASUREMENTS (mm) Holotype major: HW 1.56, HL 1.72, SL 0.74, EL 0.16, PW 0.80.
Paratype minor: HW 0.66, HL 0.72, SL 0.76, EL 0.10, PW 0.66.
COLOR The material I have examined varies according to the island of origin: reddish yellow on St. Vincent (types); light reddish brown to dark brown on Grenada; and light reddish brown on Dominica.
RANGE St. Vincent, Grenada, and Dominica. Stefan Cover and I failed to find *antillana* on Barbados, in spite of careful searching in forested habitats there.
BIOLOGY The following field notes by H. H. Smith (in Forel 1893j) on St. Vincent match those made by Stefan Cover and me on Grenada in June 1995: "A common species in forest and shady places. The colonies are generally composed of one or two hundred individuals at most, but may have as many as six or seven hundred. The formicarium is generally under bark of very rotten logs, or under a log or stick; rarely under a stone or under turf on a rock. It is an irregular chamber, with short radiating passages, the whole commonly occupying only two or three inches of space. The workers major are few in number, sometimes only one or two in the colony. Both workers major and minor are sluggish, especially the former." Smith found seeds in at least one of the nests. Sexual forms were found by him in the nests in October and November, and by Charles T. Brues on Grenada in September.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Colonia Alpina, Teresópolis, Rio de Janeiro. Scale bars = 1 mm.



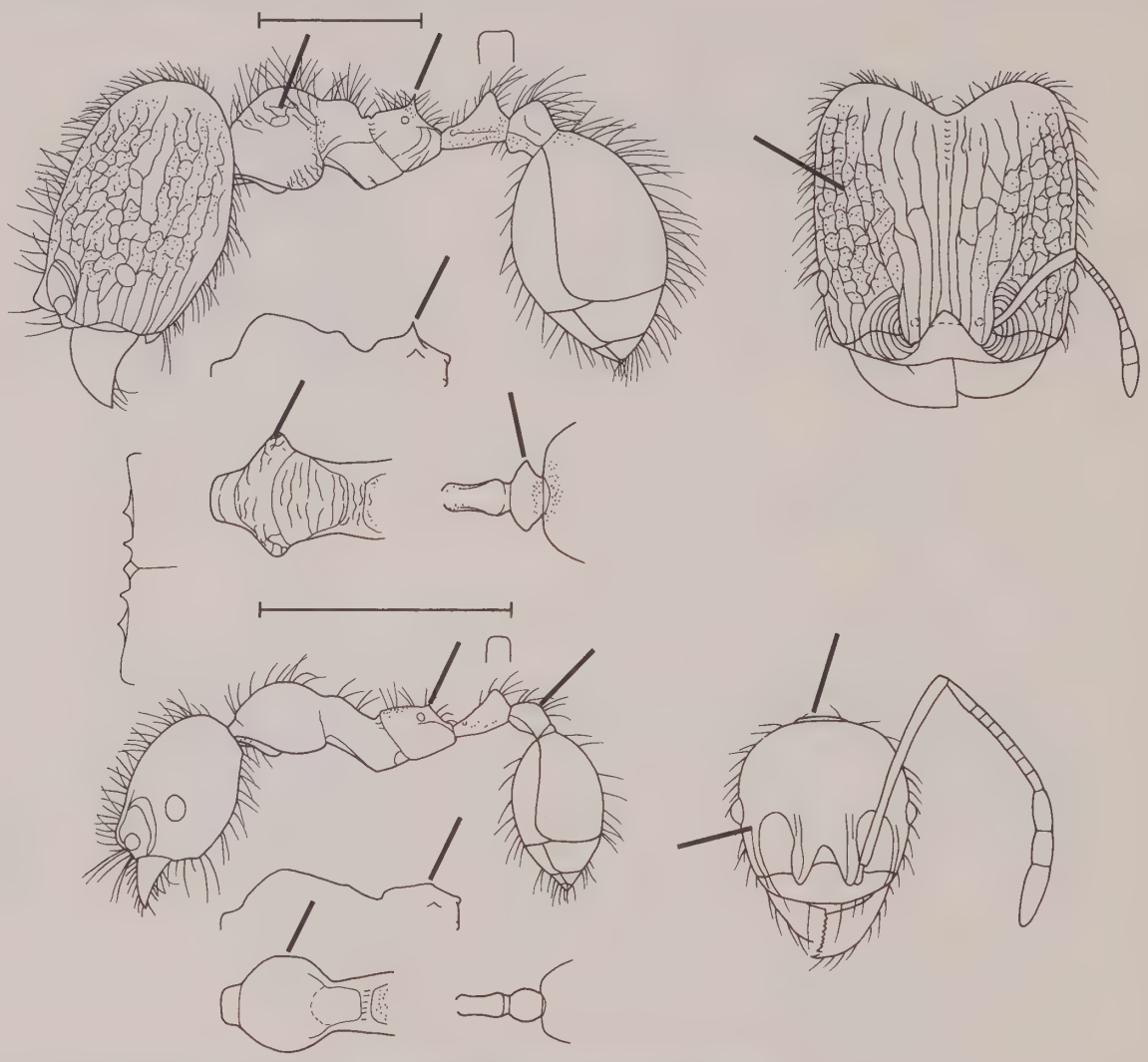
Pheidole aper Forel

Pheidole aper Forel 1912g: 227.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY L *aper,* wild boar, allusion uncertain, but may refer to tusk-like protrusion on head of major.
DIAGNOSIS Similar in various traits to *bambusarum, brevicona, dyctiota, laeviventris, lutzi, risii, rugatula, senilis, sigillata, trachyderma,* and *traini,* differing as follows.
Major: all of head except for frontal triangle and mid-clypeus but including occiput and all of pronotum rugoreticulate; seen from the side, frontal lobes and genal corners extended as triangular processes; postpetiole from above conulate.
Minor: all of posterior half of head and all of promesonotum rugoreticulate; occiput broad, lacking a nuchal collar.
MEASUREMENTS (mm) Lectotype major: HW 1.46, HL 1.56, SL 0.66, EL 0.14, PW 0.80.
Paralectotype minor: HW 0.64, HL 0.66, SL 0.66, EL 0.10, PW 0.46.
COLOR Major: gaster brownish yellow; rest of body medium reddish brown, tending toward dark reddish brown at anterior margin of head capsule; mandibles dark reddish brown; antennae medium reddish brown; legs brownish yellow.
Minor: head and mesosoma light reddish brown; waist, gaster, and appendages brownish yellow.
RANGE Rio de Janeiro and Minas Gerais, Brazil.
BIOLOGY Unknown.

Compare with *iracunda*

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Rio Reventazon, 3–5 km east of Turrialba, Cartago (William L. Brown). Scale bars = 1 mm.



Pheidole arachnion **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *arachnion,* cobweb, alluding to the loose rugoreticulum on the head of the major.

DIAGNOSIS A member of the *tristis* group characterized by the following combination of traits.

Major: dark reddish brown; sides of head covered by loose rugoreticulum (i.e. with large interspaces); humeri and postpetiolar nodes seen from above cornulate (horn-shaped); lacking any trace of antennal scrobes.

Minor: propodeal spine reduced to an obtuse angle; body entirely smooth and shiny except for several carinulae on anterior half of dorsal surface of head, one of which loops on each side of the head in a semicircle from the end of the frontal lobe to the anterior clypeal border; a thin nuchal collar present.

Very similar to *iracunda,* also of Costa Rica, but differing in details in the characters as listed and illustrated.

MEASUREMENTS (mm) Holotype major: HW 1.80, HL 1.98, SL 0.76, EL 0.18, PW 0.90.

Paratype minor: HW 0.60, HL 0.62, SL 0.74, EL 0.10, PW 0.40.

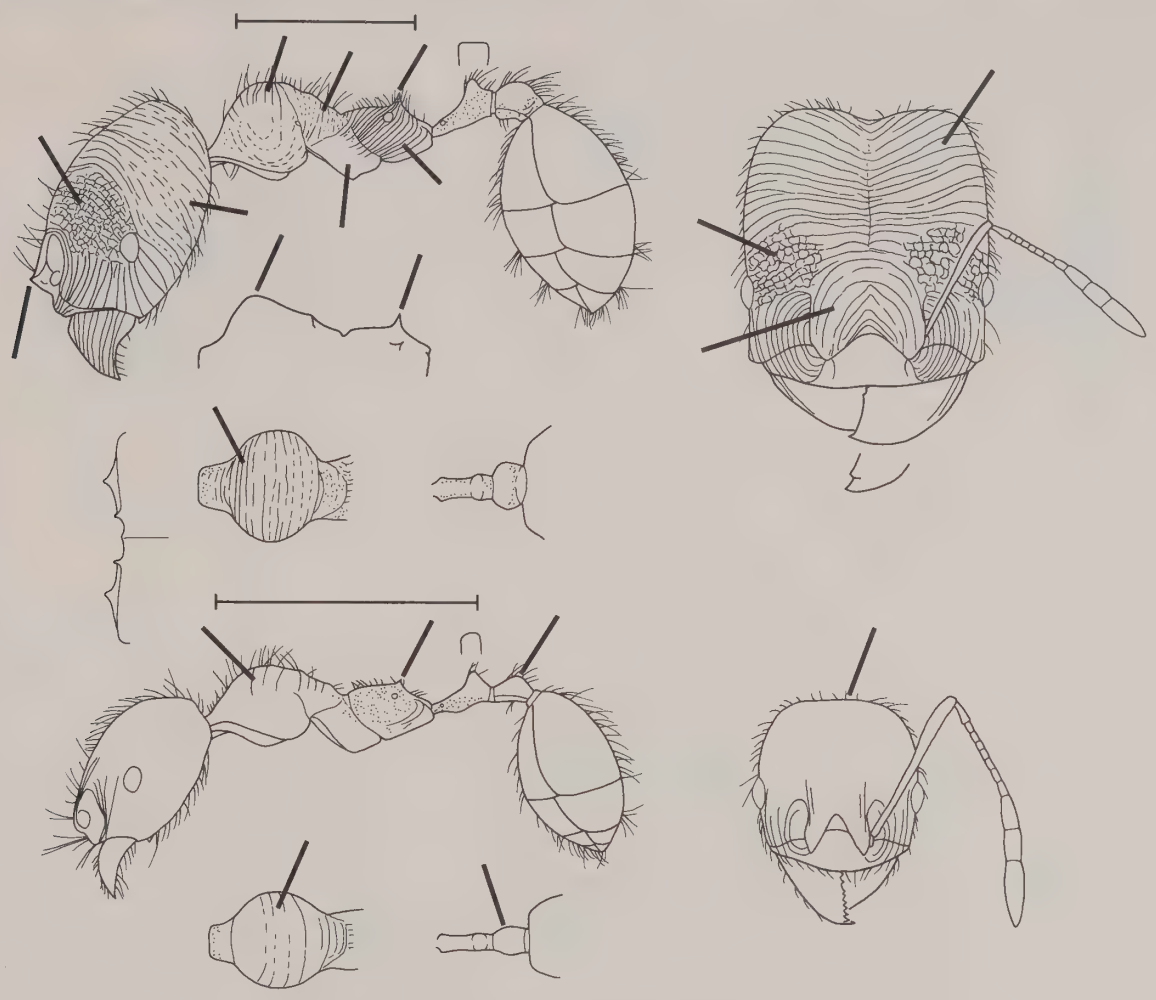
COLOR Major: body and mandibles dark reddish brown, other appendages light reddish brown.

Minor: body plain medium brown, appendages brownish yellow.

RANGE Known from the Atlantic lowlands of Costa Rica.

BIOLOGY A nest was found in rotting wood in forest at the La Selva Biological Station, near Puerto Viejo.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (Stefan Cover). Scale bars = 1 mm.



Pheidole arietans **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *arietans,* ramlike, referring to the forward-projecting frontal lobes of the major.

DIAGNOSIS A distinctive member of the *tristis* group characterized by the following traits.

Major: in side view, frontal lobe forms a conspicuous triangular projection; parallel transverse carinulae encircle the posterior half of the head; a wide band of rugoreticulum stretches from the posterior ends of each frontal lobe to the eye; the two frontal lobes are covered by a common set of parallel semicircular carinulae; promesonotum and propodeum covered by longitudinal carinulae.

Minor: occiput broad, lacking a nuchal collar; margins of pronotal dorsum and all of mesonotal dorsum with transverse carinulae.

Close to *glyphoderma,* also of Costa Rica, but differing in many features of body form and sculpturing as illustrated.

MEASUREMENTS (mm) Holotype major: HW 1.18, HL 1.34, SL 0.64, EL 0.16, PW 0.66.

Paratype minor: HW 0.56, HL 0.60, SL 0.56, EL 0.12, PW 0.38.

COLOR Major: posterior four-fifths of head capsule, and all of mesosomal dorsum, waist, and gaster dark brown; clypeus, a strip just posterior to the clypeus, mandibles, and side of mesosoma medium reddish brown; antennae and legs brownish yellow.

Minor: body concolorous medium brown, appendages yellow to light brownish yellow.

RANGE Atlantic slope of Costa Rica from near sea level to 1000 m elevation (in Braulio Carrillo National Park) (Longino 1997).

BIOLOGY The type colony was collected by Stefan Cover in a hollow rotten stick on the floor of mature lowland rainforest. Seeds were present in the nest. Longino (1997) found one nest in a very wet rotten log, and others in internodes of *Cecropia* seedlings, as well as live stems of *Myriocarpa* along streams. One arboreal nest was found in a hollowed-out section of a live branch in a fresh treefall; this colony had a seed cache.

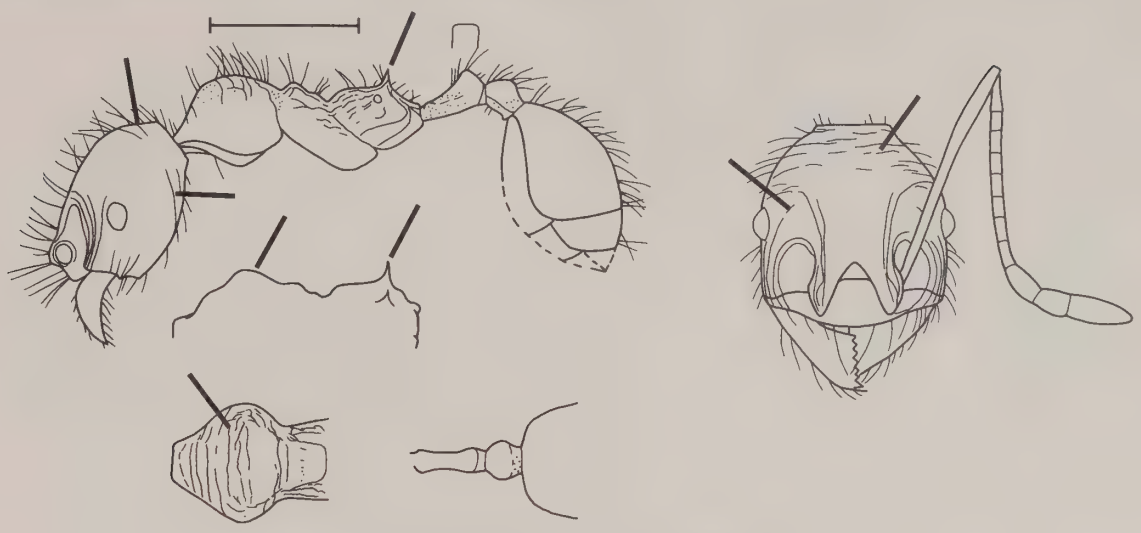
FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Santa Catarina. Scale bars = 1 mm.

Pheidole auropilosa Mayr

Pheidole auropilosa Mayr 1887: 596.

TYPES Naturhist. Mus. Wien.
ETYMOLOGY L *auropilosa,* golden (yellow) hair.
DIAGNOSIS A very large, yellow member of the *tristis* group strongly distinguished by the following traits.
Major: humerus seen in dorsal-oblique view very prominent, bluntly right-angular; a convex process extrudes from center of postpetiolar venter in side view; postpetiolar node diamond-shaped from above; anterior two-thirds of dorsal surface of head densely covered by longitudinal carinulae, those originating from the anterior margin of the lateral clypeal border curving outward toward the eye and those originating from the posterior frontal carinae traveling to the sides of the head.
Minor: occipital border broad, lacking nuchal collar; postpetiole diamond-shaped from above.
MEASUREMENTS (mm) Lectotype major: HW 2.06, HL 2.06, SL 1.10, EL 0.22, PW 0.86.
Paralectotype minor: HW 0.84, HL 0.84, SL 1.04, EL 0.14, PW 0.52.
COLOR Major: body light reddish yellow, shaded slightly darker on the gaster.
Minor: concolorous dark yellow.
RANGE Southeastern Brazil, from Espírito Santo south to Rio Grande do Sul, and Misiones, Argentina.
BIOLOGY Unknown.

FIGURE Lectotype, minor. BRAZIL: Alto da Serra, São Paulo. Paralectotype major not shown; very similar to *guilelmimuelleri* lectotype major (q.v.). Scale bar = 1 mm.



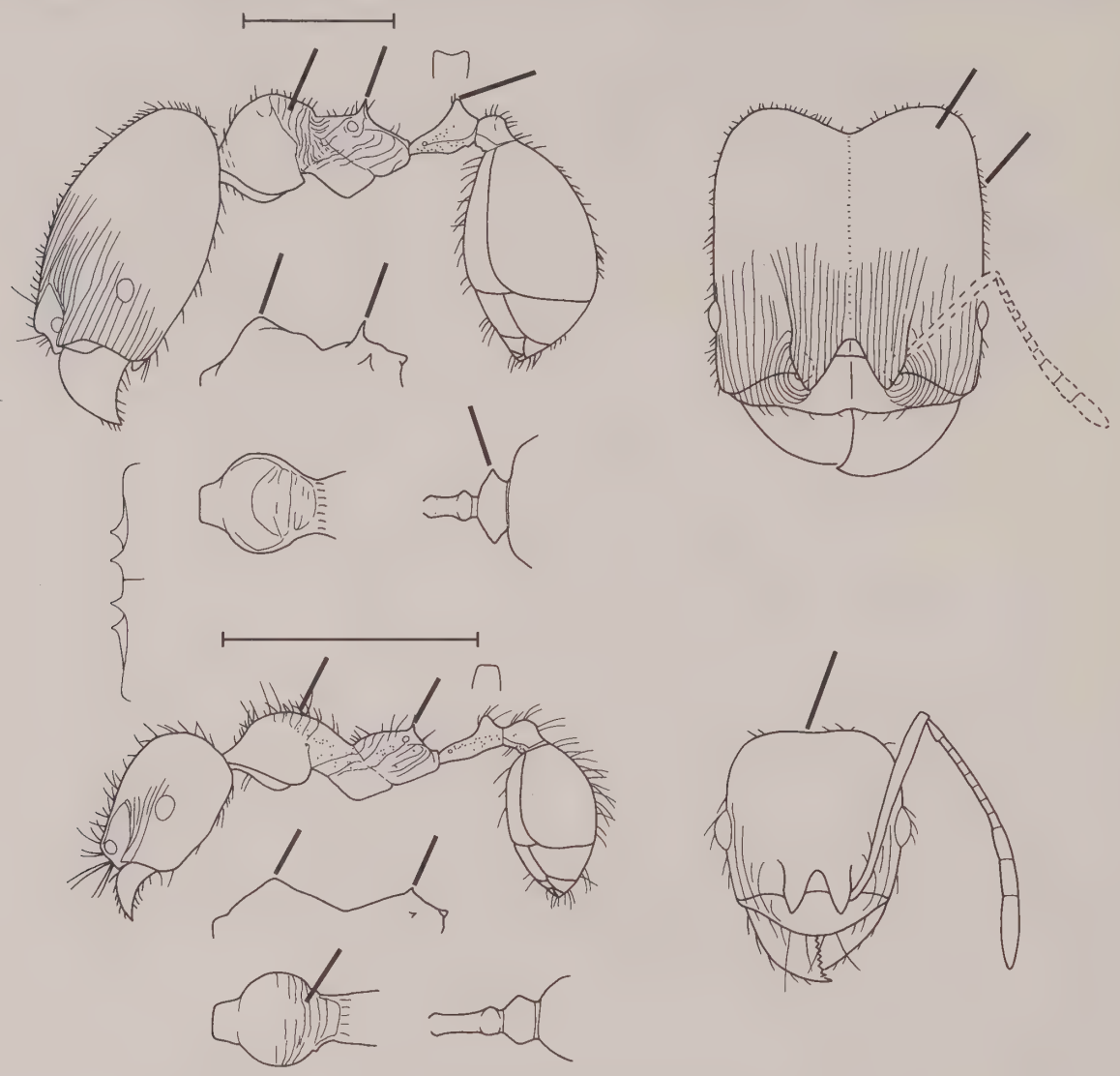
Pheidole avia Forel, **new status**

Pheidole guilelmimuelleri subsp. *avia* Forel 1908h: 380.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY L *avia,* pertaining to birds, allusion unknown.
DIAGNOSIS Similar to *antillana* of the Lesser Antilles and to *bucculenta, guilelmimuelleri,* and *hetschkoi* of South America, as well as to *mamore* of South America in the *scrobifera* group, but differing in the following combination of traits.
Major: very large, with sharp postpetiolar cornicles, otherwise close to the lectotype major of *guilelmimuelleri* (q.v.); but the minor is very distinct.
Minor: occiput and anterior fourth of head bears transverse carinulae; carinulae originating on the frontal lobes curve outward (laterad) to join the anteriormost transverse posterior carinulae; anterior half of the pronotal dorsum transversely carinulate; rest of the head and body almost entirely smooth and shiny; propodeal spines moderately long, thin, and vertical.
MEASUREMENTS (mm) Paralectotype major: HW 2.34, HL 2.40, SL 1.04, EL 0.24, PW 1.12.
Lectotype minor: HW 1.00, HL 1.14, SL 2.04, EL 0.24, PW 0.68.
COLOR Major: reddish yellow.
Minor: concolorous plain yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *alayoi, androsana, cubaensis, macromischoides, naylae, ursus*

FIGURE Upper: syntype, major (damaged specimen; outline of antenna drawn from specimen collected at San Blas, Pinar del Rio). Lower: syntype, minor. CUBA: Havana. Scale bars = 1 mm.

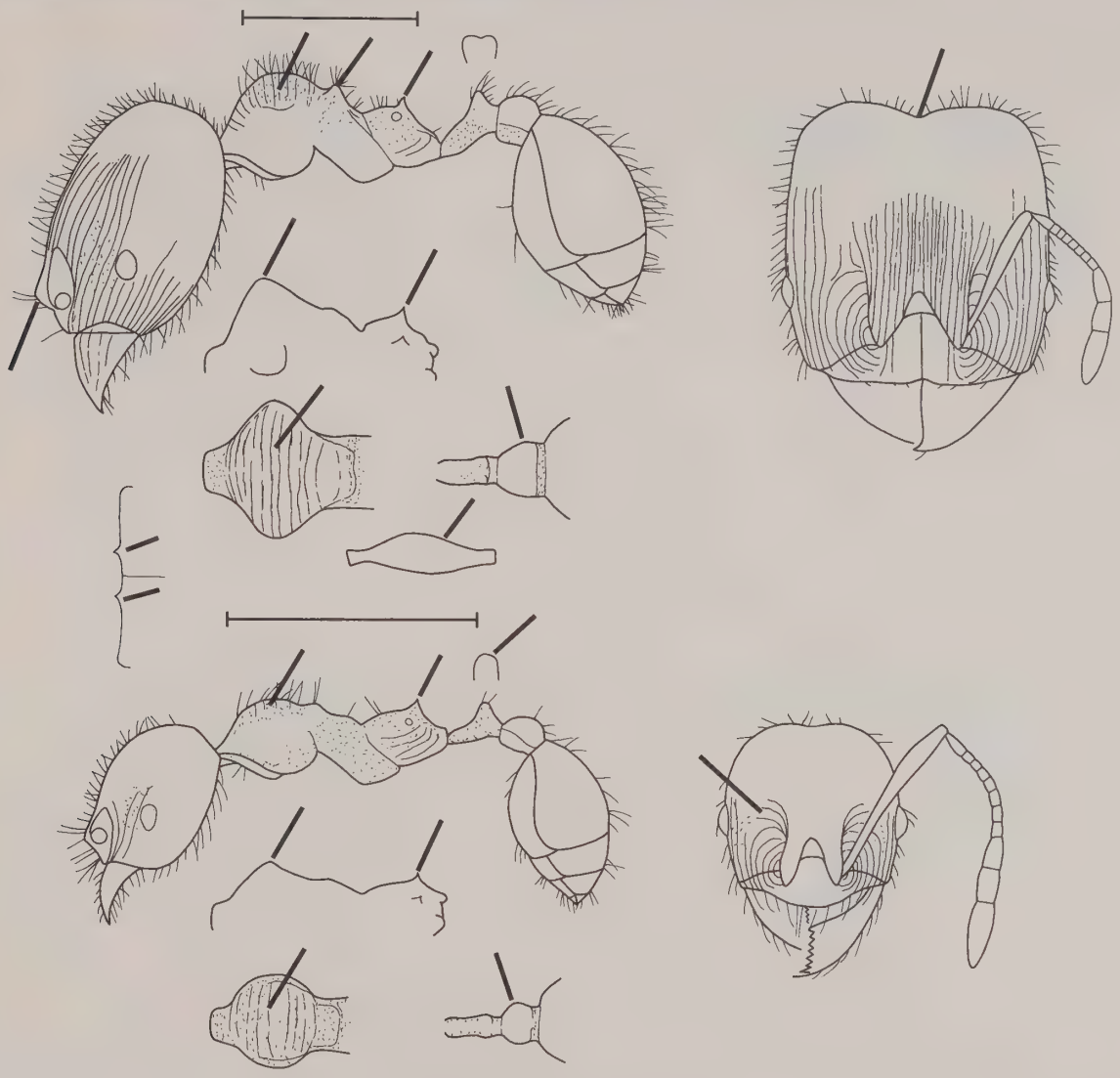


Pheidole bakeri Forel

Pheidole bakeri Forel 1912c: 82.

TYPES Mus. Hist. Nat. Genève; Mus. Comp. Zool. Harvard.
ETYMOLOGY Eponymous.
DIAGNOSIS Most similar to *androsana* of the Bahamas, from which it differs principally by the smooth and shiny posterior half of the **major's** head capsule and carinulate mesopleuron, as well as by its longer propodeal spines.
MEASUREMENTS (mm) Syntype major: HW 1.60, HL 1.90, SL (not measured), EL 0.22, PW 0.80.
Syntype minor: HW 0.60, HL 0.64, SL 0.62, EL 0.12, PW 0.40.
COLOR Major: concolorous medium yellow with a slight reddish tinge, hence light "orange."
Minor: concolorous medium yellow.
RANGE Known only from Cuba (Havana and San Blas, Pinar del Rio).
BIOLOGY Unknown.

FIGURE Upper: holotype, major; the leg part shown is the right hind femur (Salinas, Rio Beni, Bolivia). Lower: minor, tentatively associated with holotype by Carlos Emery (Bolivia). Scale bars = 1 mm.



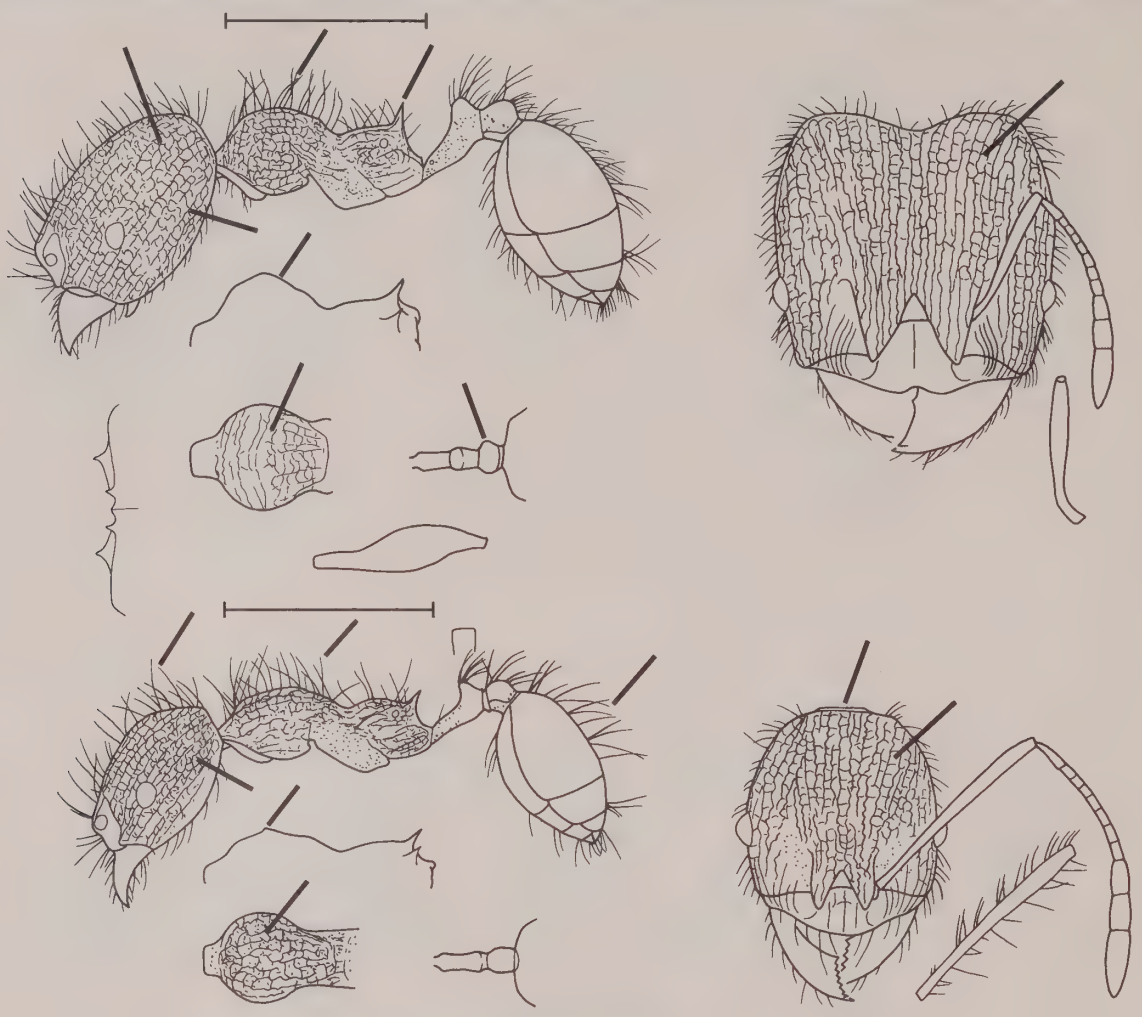
Pheidole balzani Emery

Pheidole balzani Emery 1894d: 161.

TYPES Mus. Civ. Stor. Nat. Genova.
ETYMOLOGY Named after the collector, Luigi Balzan.
DIAGNOSIS A large, robust member of the *tristis* group with quadrate head shape in full-face view, similar to *fabricator, gaigei, godmani, grantae, nigella,* and *tristis,* and distinguished by the following combination of traits.
Major: head quadrate, with shallow median occipital cleft in full-face view; hind femora swollen in middle; frontal lobe extended as short angular protrusion in side view; humerus in dorsal-oblique view very prominent, and right-subtriangular in outline; postpetiole bell-shaped from above; all of pronotal dorsum transversely carinulate.
Minor: humerus prominent, subangulate; carinulae originating from frontal carinae curve laterally toward sides of head; pronotal dorsum transversely carinulate.
MEASUREMENTS (mm) Holotype major: HW 1.58, HL 1.66, SL 0.84, EL 0.20, PW 0.80.
Paratype minor: HW 0.72, HL 0.72, SL 0.72, EL 0.12, PW 0.48.
COLOR Major: body and mandibles dark reddish brown, appendages medium brownish yellow.
Minor: body plain medium brown, appendages plain light brown.
RANGE Known only from the type locality and Rancho Grande, Venezuela, 1100 m.
BIOLOGY Unknown.

Compare with species listed
in the Diagnosis below

FIGURE Upper: paratype, major of synonymous *P. ogloblini* Kusnezov. Lower: syntype, minor of synonymous *P. ogloblini* Kusnezov. ARGENTINA: Yacuy, Misiones. (Type locality: São Paulo, Brazil, collected by Adolphe Lutz). Scale bars = 1 mm.

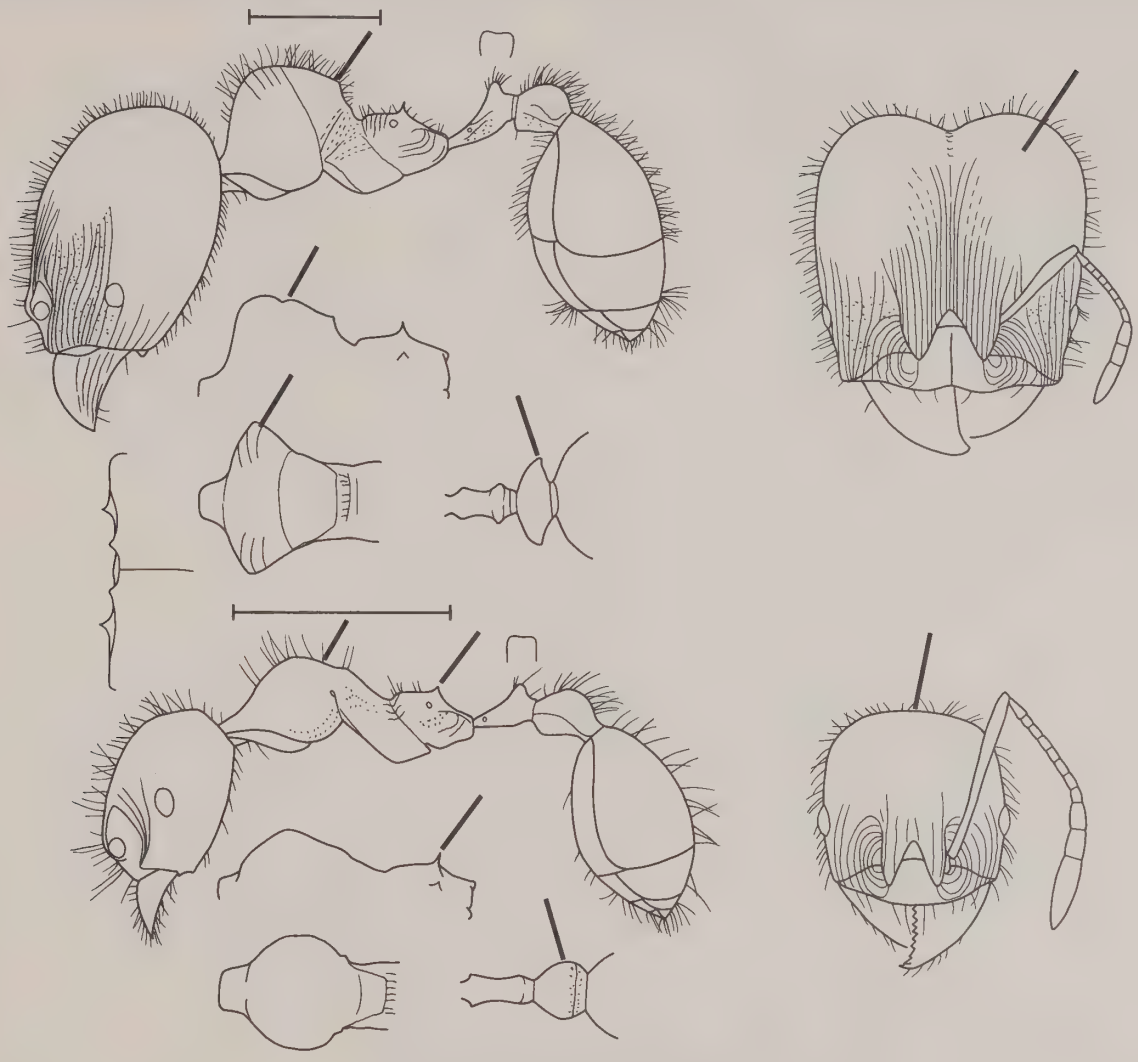


Pheidole bambusarum Forel

Pheidole bambusarum Forel 1908h: 376. Syn.: *Pheidole ogloblini* Kusnezov 1952d: 85, synonymy by Kempf 1972d: 450.

TYPES Mus. Hist. Nat. Genève; Mus. Comp. Zool. Harvard.
ETYMOLOGY NL *bambusarum,* belonging to bamboo (*Bambusa*).
DIAGNOSIS A densely sculptured member of the *tristis* group notable for the almost complete covering of the head and pronotum with rugoreticula in both **major** and **minor**. Most similar to *brevicona* (but also compare *aper, dyctiota, laeviventris, lutzi, risii, rugatula, senilis, sigillata, trachyderma,* and *traini*), differing in the major in the rugoreticulate venter of the head and sides of pronotum; the oval (as opposed to cone-shaped) postpetiolar node; smaller size; and lighter color.
MEASUREMENTS (mm) Syntype major *(bambusarum)*: HW 1.14, HL 1.20, SL 0.66, EL 0.16, PW 0.56.
Syntype minor *(bambusarum)*: HW 0.70, HL 0.78, SL 0.74, EL 0.12, PW 0.44.
COLOR Major: body light brownish yellow except for the gaster and appendages which are pale yellow.
Minor: body medium yellow except for the gaster and appendages which are pale yellow.
Syntypes of synonymous *ogloblini* are yellow (major) or light reddish brown (minor).
RANGE Known from southern Brazil (Espírito Santo, Rio de Janeiro, São Paulo) and north-central Argentina (Misiones).
BIOLOGY The types were collected from large hollow bamboos in a forest near São Paulo.

FIGURE Upper: holotype, major. Lower: paratype minor. COLOMBIA: Finca Merenberg, 12 km west of Belén, Huila, 2200 m (C. Kugler and J. Hahn). Scale bars = 1 mm.

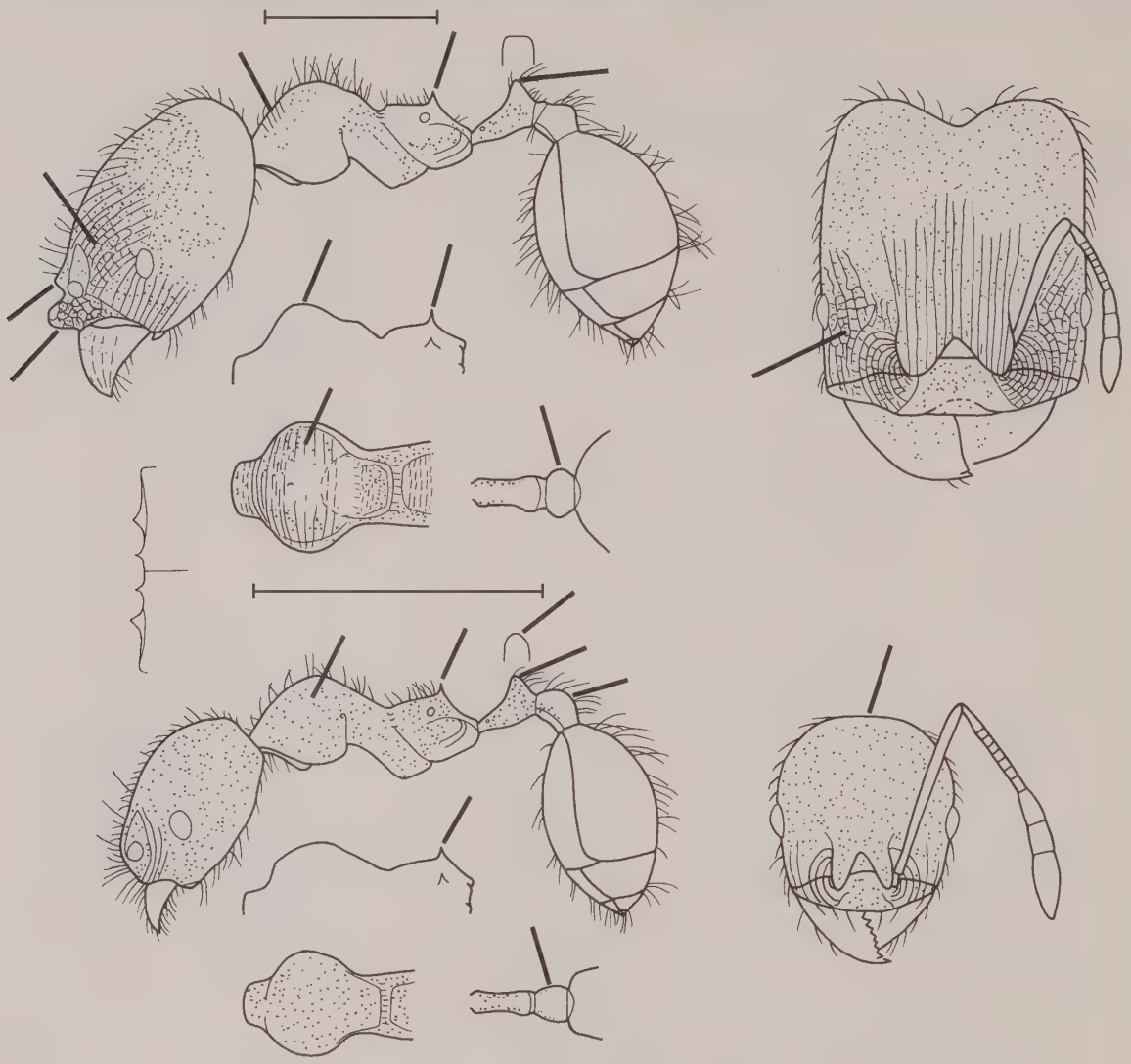


Pheidole bellatrix **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *bellatrix,* female warrior.
DIAGNOSIS An unusually large member of the *tristis* group, similar to *napoensis* of Ecuador and more distantly so to *pepo, rotundiceps, sphaerica,* and *subsphaerica,* which are species variously from Colombia and Ecuador, and distinguished by the following set of traits.
Major: promesonotum in side view forms a very large hump towering over the propodeum; from above the humeri are very broad, completely covering the rest of the pronotum below; from above the anterior margin of the postpetiolar node forms a perfect semicircle, with the posterior border a straight line forming its base; antennal scrobes absent; entire body covered by dense pilosity.
MEASUREMENTS (mm) Holotype major: HW 2.00, HL 2.06, SL 0.92, EL 0.22, PW 1.30.
Paratype minor: HW 0.78, HL 0.82, SL 0.76, EL 0.14, PW 0.48.
COLOR Major: body light reddish brown, appendages brownish yellow.
Minor: concolorous light brownish yellow.
RANGE In addition to the type locality in Huila, *bellatrix* has been collected in Cundinamarca (1100 m), Magdalena (elevation unknown), and Meta (1000 m).
BIOLOGY Winged queens were collected from the type nest sometime during 9–13 January.

Compare with *diabolus, gravida, mirabilis, moseni, mosenopsis, nasifer, rhinoceros, unicornis*

FIGURE Upper: holotype, major. Lower: paratype minor. COLOMBIA: Finca Los Guaduales, 10 km southwest of San José del Palmar, Rio Torito, 760 m (Charles Kugler). Scale bars = 1 mm.



Pheidole binasifer **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *binasifer,* bearing two noses, referring to the projecting clypeal carina and nearest frontal lobe in side view.

DIAGNOSIS A medium-sized member of the *tristis* group immediately recognizable as follows.

Major: in side view the median clypeal carina and nearest frontal lobe protrude as lobes from the anterior profile of the head like a pair of noses; propodeal spines small, slender, and perfectly vertical to the basal propodeal face; postpetiolar node oval; space between eye and antennal fossa rugoreticulate; pronotal dorsum transversely carinulate.

Minor: propodeal spines small and slender, and perfectly vertical to the basal propodeal face; head and mesosoma completely foveolate and opaque; occiput narrowed slightly, but lacks a nuchal collar; postpetiolar node depressed, and postpetiole overall cylindrical in shape.

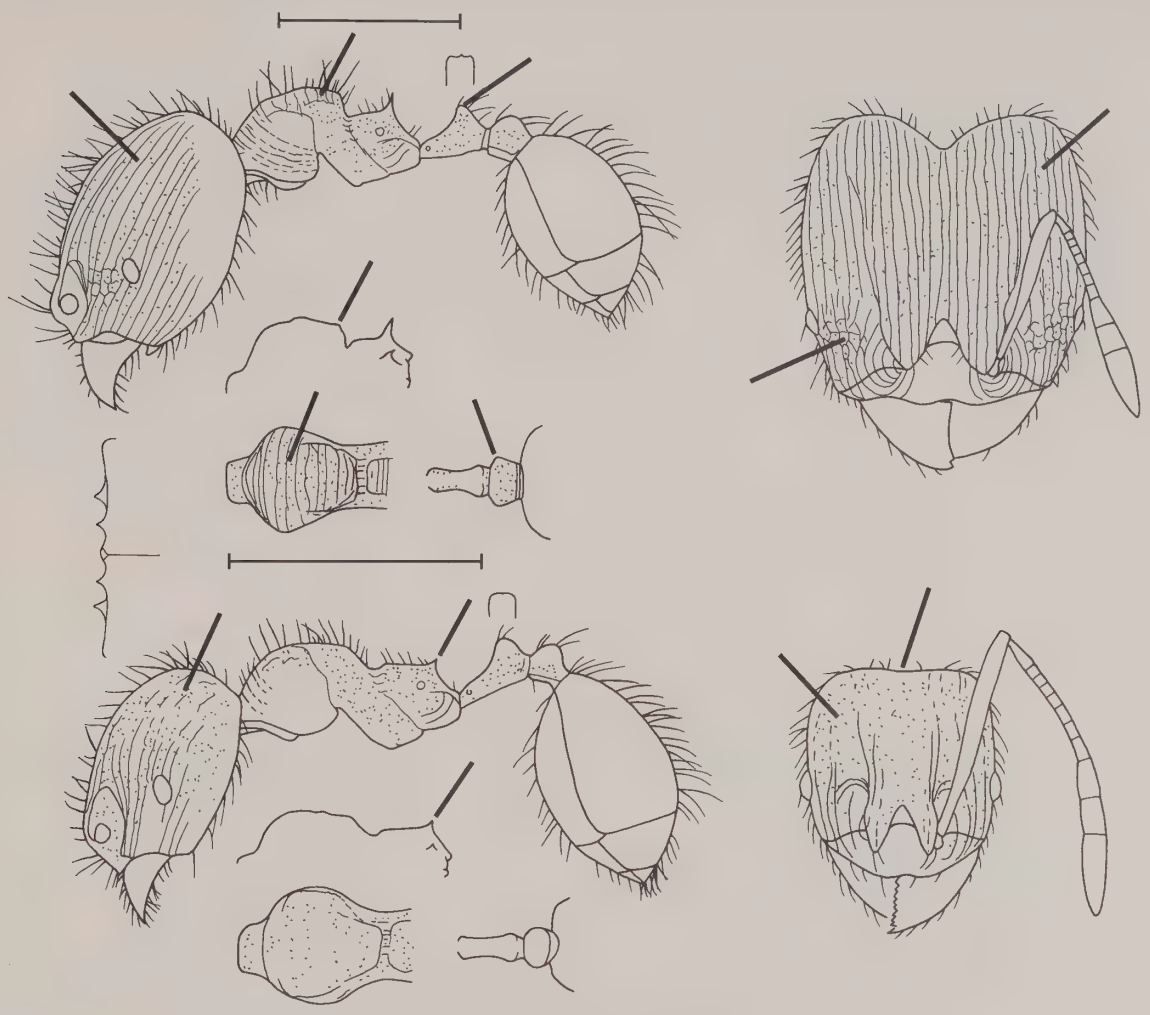
MEASUREMENTS (mm) Holotype major: HW 1.08, HL 1.32, SL 0.62, EL 0.14, PW 0.64.
Paratype minor: HW 0.54, HL 0.62, SL 0.58, EL 0.08, PW 0.36.

COLOR Major: body light brown, appendages brownish yellow.
Minor: medium brown, appendages brownish yellow.

RANGE Known only from the type locality.

BIOLOGY The type colony was found on a forested midmountain slope.

FIGURE Upper: holotype, major. Lower: paratype minor. BOLIVIA: La Games, Parque Nacional Noel Kempff Mercado, Santa Cruz, 14°48′S 60°23′W, 700 m (Philip S. Ward). Scale bars = 1 mm.

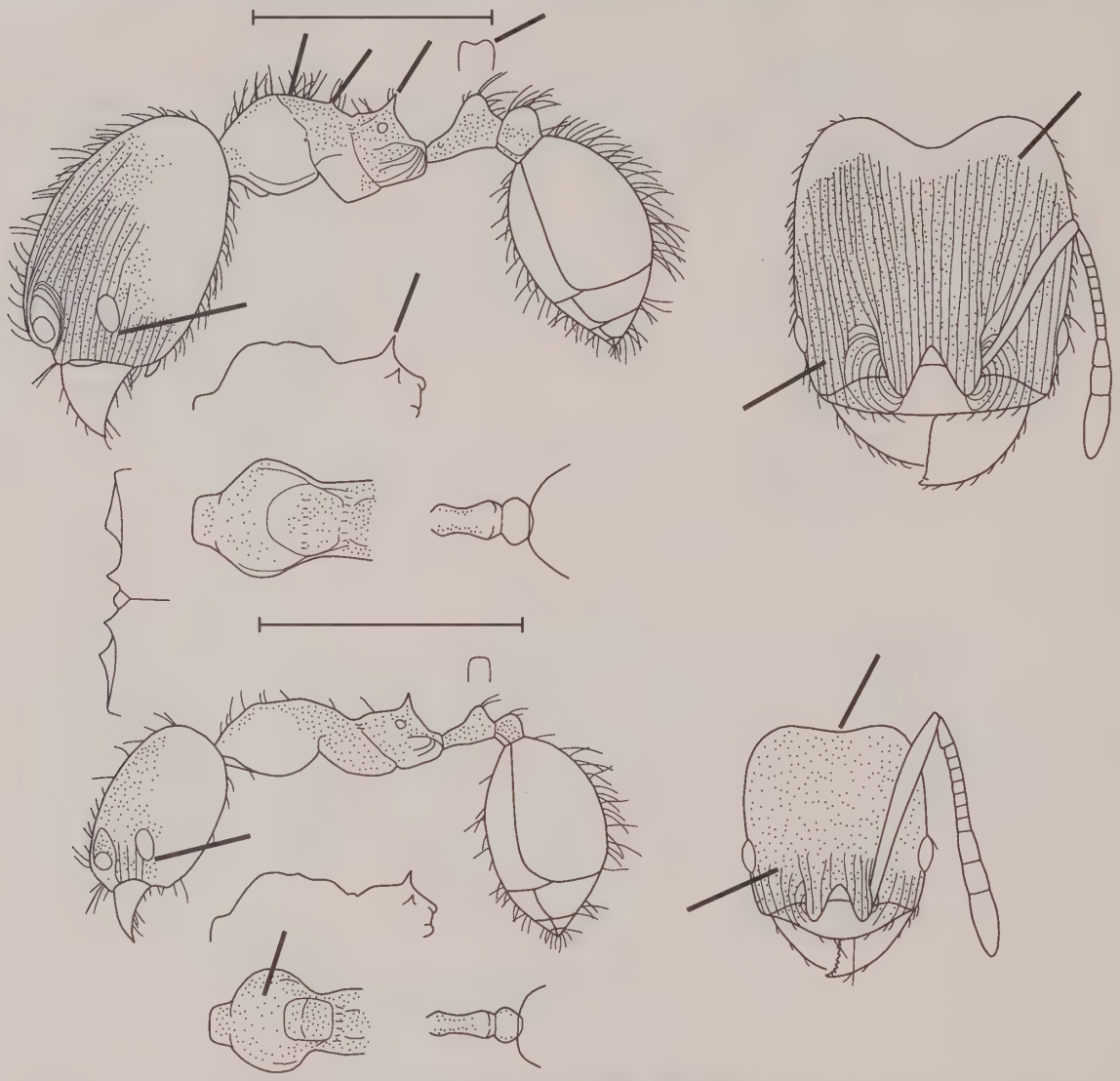


Pheidole bison **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L Gr *bison,* the wisent (European bison), alluding to the massive humped back of the major.
DIAGNOSIS A medium-sized member of the *tristis* group similar to *bellatrix, napoensis,* and *pullula,* differing as follows.
Major: promesonotum a single massive piece, its dorsal border forming a single convexity that drops vertically at the rear to the metanotum; head entirely covered with longitudinal carinulae except for frontal triangle and central section of clypeus; space between eye and antennal fossa rugoreticulate; petiolar node in side view tapered apically to a blunt point; postpetiolar node from above trapezoidal.
Minor: almost all of head and mesosoma foveolate and opaque; irregular broken rugulae present on posterior dorsal head surface; propodeal spines reduced to denticles; occiput broad, weakly concave.
MEASUREMENTS (mm) Holotype major: HW 1.26, HL 1.30, SL 0.76, EL 0.12, PW 0.60.
Paratype minor: HW 0.62, HL 0.64, SL 0.64, EL 0.08, PW 0.44.
COLOR Major: head dark reddish brown, rest of body medium reddish brown, appendages light reddish brown.
Minor: concolorous brownish yellow.
RANGE Known only from the type locality.
BIOLOGY The type series was collected by Philip S. Ward from a termite nest in savanna.

Compare with *carapuna, cornicula, cuprina, eriophora, jivaro, manuana, tristicula*

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: 8 km north of Volcano Barba, Heredia, 10°12′N 84°06′W, 1830 m (J. T. Longino). Scale bars = 1 mm.



Pheidole boltoni **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named in honor of the distinguished British ant systematist Barry Bolton.

DIAGNOSIS A small, bicolorous species belonging to an ambiguous cluster composing the "*carapuna* complex" *(boltoni, carapuna, cornicula, cuprina, eriophora, jivaro, manuana, tristicula)* close to the *flavens* group. All are relatively small in size, with the **major** possessing a reduced mesonotal convexity and cephalic sculpturing, composed in turn entirely of longitudinal carinulae that extend to or close to the occipital border viewed in full face. All also have a **minor** with a broad, concave occiput, which lacks a nuchal collar. Among these species, *P. boltoni* is distinguished as follows.

Major: relatively flat profile of the promesonotum in dorsal-oblique view; eye set well forward so that its anterior margin is the same distance from the anterior genal border as the Eye Length; small, obtuse-angulate mesonotal convexity; and smooth, shiny occiput, postpetiolar node, and first gastral tergite.

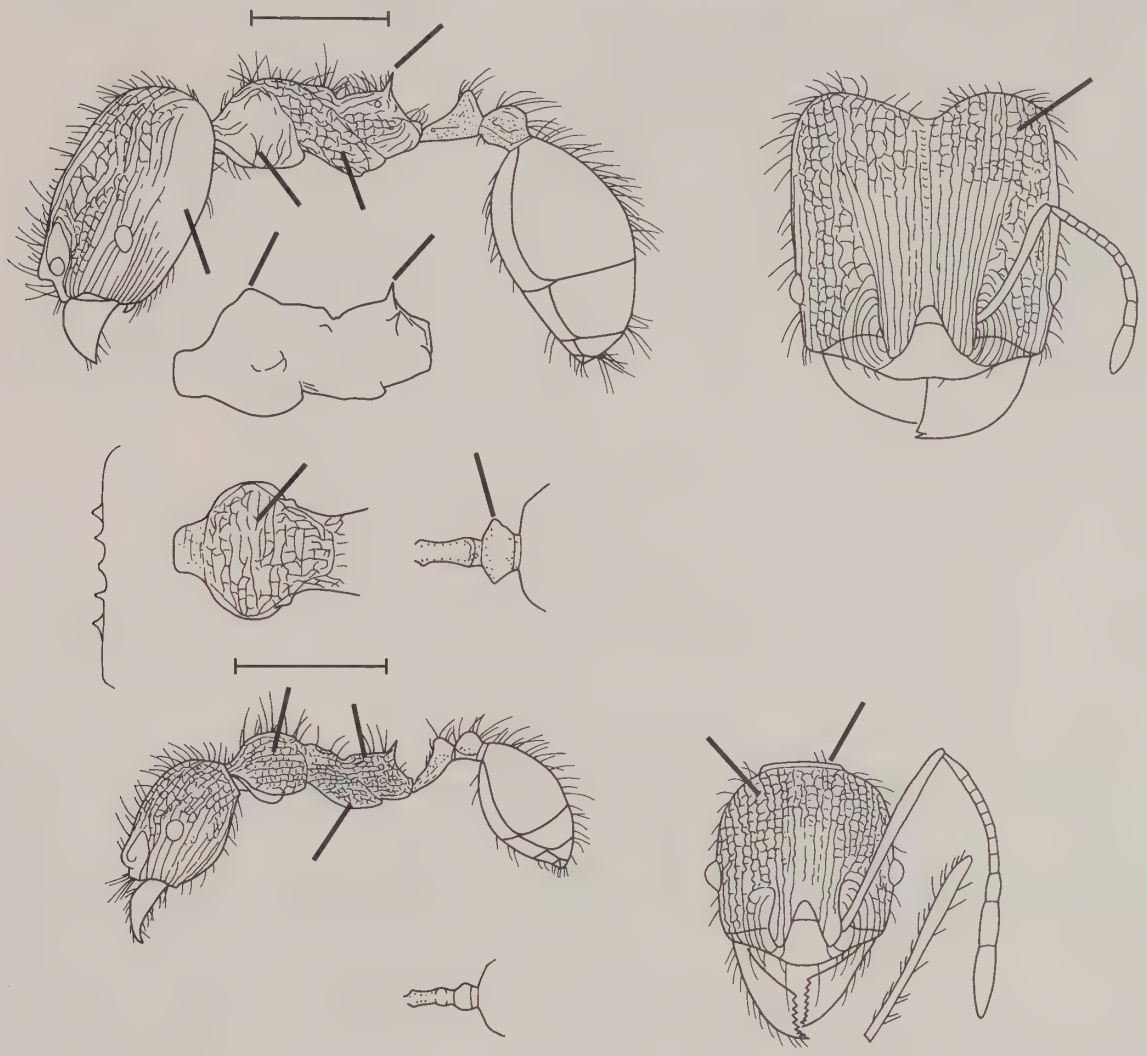
MEASUREMENTS (mm) Holotype major: HW 1.06, HL 1.06, SL 0.62, EL 0.18, PW 0.48.
Paratype minor: HW 0.60, HL 0.60, SL 0.60, EL 0.12, PW 0.34.

COLOR Major: head dark reddish yellow, rest of body light reddish brown, legs dark yellow.
Minor: concolorous dark yellow.

RANGE Known from only two collections at the type locality.

BIOLOGY Found by Longino (1997) nesting in epiphyte clumps in wet forest.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Santa Catarina. Scale bars = 1 mm.



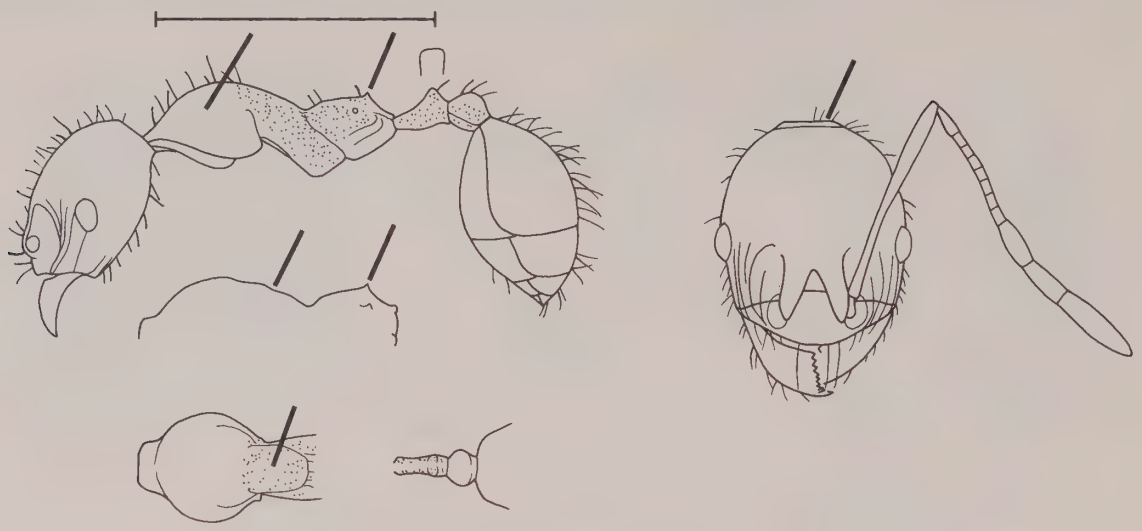
Pheidole brevicona Mayr

Pheidole breviconus Mayr 1887: 585. Syn.: *Pheidole kraepelini* Forel 1901m: 79, n. syn.

TYPES Naturhist. Mus. Wien.
ETYMOLOGY L *brevicona,* short cone, allusion unknown.
DIAGNOSIS A heavily sculptured member of the *tristis* group notable for the extensive rugoreticulation over much of the body in both the **major** and **minor**. Most similar to *bambusarum* (but also compare *aper, dyctiota, laeviventris, lutzi, risii, rugatula, senilis, sigillata, trachyderma,* and *traini*), differing in the **major** by the mostly smooth and shiny venter of the head, carinulate (as opposed to mostly rugoreticulate) vertex, the mostly smooth side of the pronotum, and the cone-shaped (as opposed to oval) postpetiolar node; larger size; and darker color.
MEASUREMENTS (mm) Lectotype major: HW 1.72, HL 1.78, SL 0.92, EL 0.24, PW 0.84.
Paralectotype minor: HW 0.74, HL 0.84, SL 0.92, EL 0.14, PW 0.50.
COLOR Major: body and mandibles medium reddish brown, legs and antennae light reddish brown.
Minor: body medium reddish brown, appendages brownish yellow.
RANGE São Paulo and Santa Catarina states, Brazil.
BIOLOGY Unknown.

Compare with *ambigua*

FIGURE Syntype, minor. ARGENTINA: Rosário de la Frontera, Salta. Scale bar = 1 mm.



Pheidole bruchi Forel

Pheidole bruchi Forel 1914d: 274. Raised to species level in this monograph: *brunnescens*.

TYPES Mus. Hist. Nat. Genève.

ETYMOLOGY Named in honor of the Argentine entomologist Carlos Bruch.

DIAGNOSIS Known to me only from a syntype minor, as illustrated (syntype majors could not be located in the Forel Collection). Closest to and possibly the same as *ambigua* (q.v.). Distinguished in the **minor** caste by the sparse pilosity; propodeal spines reduced to denticles; narrowed occiput with nuchal collar; and the pattern of sculpturing, including the absence of carinulae on the mesosoma.

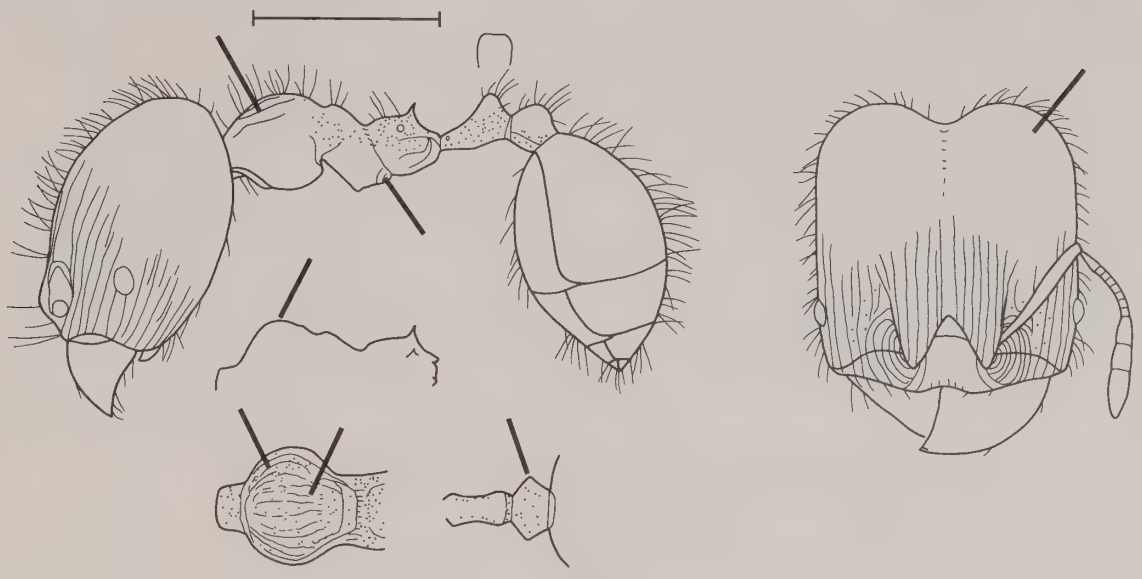
MEASUREMENTS (mm) Syntype minor: HW 0.54, HL 0.66, SL 0.74, EL 0.12, PW 0.34.

COLOR Minor: concolorous medium brown, appendages a slightly contrasting yellowish brown.

RANGE Kempf (1972b) lists *bruchi* from Buenos Aires, Córdova, Misiones, Salta, and Tucumán in Argentina.

BIOLOGY Unknown.

FIGURE Unique holotype, major. BRAZIL: Rio Negro, Paraná. (Minor unknown.) Scale bar = 1 mm.



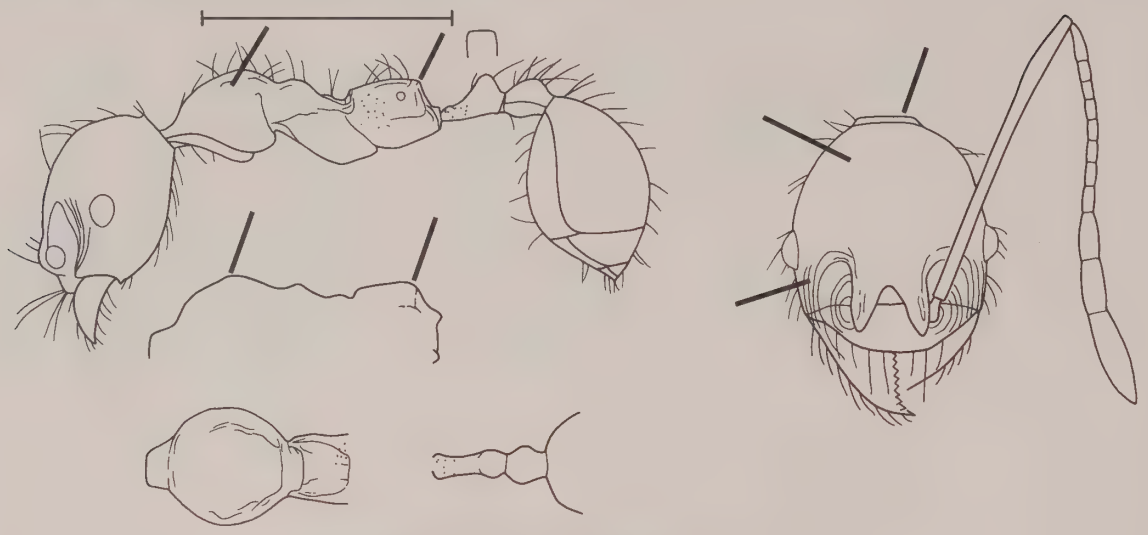
Pheidole brunnescens Santschi, **new status**

Pheidole bruchi var. *brunnescens* Santschi 1929d: 285.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY ML *brunnescens,* dusky, brown.
DIAGNOSIS Similar in various ways to *balzani, exarata, excubitor, fabricator, germaini, hispaniolae, nigella, prattorum, sabina, sarpedon, tristis, tristops,* and *unicornis,* distinguished as follows.
Major: pronotal dorsum longitudinally carinulate, with carinulae near midline straight and those near margin curving; head in full-face view subrectangular, the posterior half of dorsal face smooth and shiny and anterior half carinulate; humerus in dorsal-oblique view low and rounded; postpetiole from above diamond-shaped.
Minor: unknown.
MEASUREMENTS (mm) Holotype major: HW 1.56, HL 1.70, SL 0.80, EL 0.20, PW 0.92.
COLOR Major: body light reddish brown, mandibles medium reddish brown, other appendages yellow.
RANGE Known only from the type series.
BIOLOGY Unknown.

Compare with species listed
in the Diagnosis below

FIGURE Lectotype, minor. BRAZIL: Alto da Serra, São Paulo. Paralectotype major not shown; very similar to *guilelmimuelleri* lectotype major (q.v.). Scale bar = 1 mm.

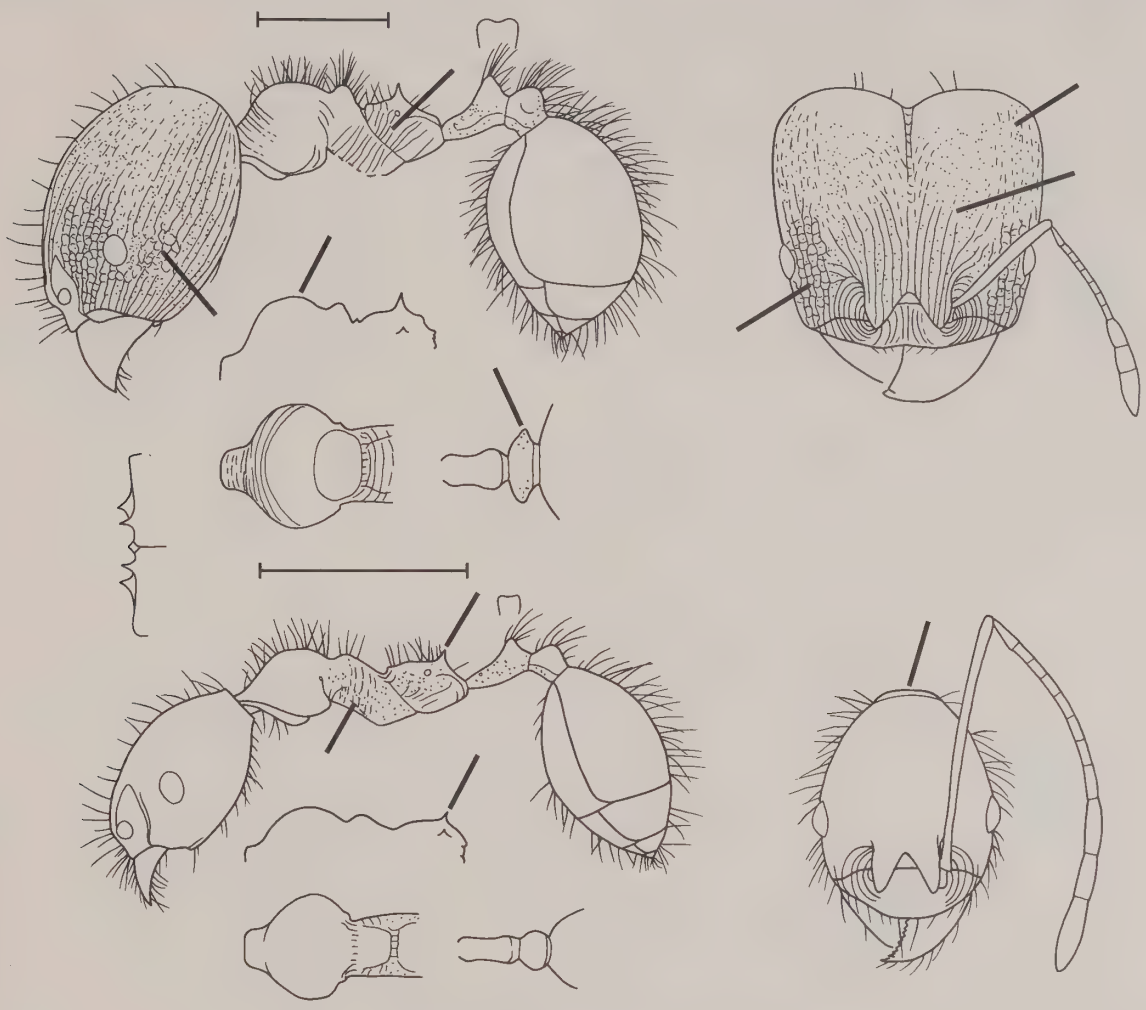


Pheidole bucculenta Forel, **new status**

Pheidole guilelmimuelleri subsp. *bucculenta* Forel 1908h: 379. Not seen: types of *Pheidole guilelmimuelleri* subsp. *bucculenta* var. *socrus* Forel 1914e: 12 (Colombia), an unavailable name (quadrinomial).

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY L *bucculenta,* with full cheeks, allusion unknown.
DIAGNOSIS Similar to *antillana* of the Lesser Antilles and the South American *avia, guilelmimuelleri, hetschkoi, heyeri, hortonae, praeses,* and *rhytifera,* as well as to *mamore* in the *scrobifera* group, but differing in the following combination of traits.
Major: very close to the lectotype major of *guilelmimuelleri* (q.v.), but the **minor** is very distinct, as follows: propodeal spines absent, replaced by right-angular junctions between the basal and posterior propodeal faces; humerus smoothly rounded in dorsal-oblique view; head and body almost completely smooth and shiny, with sculpturing on head comprising only short carinulae anterior to the level of the eyes.
MEASUREMENTS (mm) Paralectotype major: HW 1.76, HL 1.76, SL 0.84, EL 0.10, PW 0.84.
Lectotype minor: HW 0.64, HL 0.76, SL 0.96, EL 0.12, PW 0.46.
COLOR Major: not recorded.
Minor: concolorous clear yellow.
RANGE Known only from the state of São Paulo, Brazil.
BIOLOGY A nest was found in wet mountain forest near Salesópolis, São Paulo, 850 m, by William L. and Doris E. Brown.

FIGURE Upper: holotype, major. Lower: paratype, minor. ECUADOR: Jatun Sacha, Napo (Leeanne E. Tennant-Alonso). Scale bars = 1 mm.



Pheidole bulliceps **new species**

TYPES INBio.

ETYMOLOGY L *bulliceps,* bubble-headed, with reference to the major.

DIAGNOSIS A large member of the *tristis* group, similar to *rotundiceps,* less so to *pepo, sphaerica,* and *subsphaerica,* distinguished by the following traits in the **major**: head capsule in full-face view roughly circular in outline; extensive patches of rugoreticulum present mesad and laterad to the eye; most of remainder of head longitudinally carinulate, with carinulae just laterad to the frontal carinae turning outward; central zone of occiput smooth and shiny; almost all of propodeum carinulate.

MEASUREMENTS (mm) Holotype major: HW 2.28, HL 2.24, SL 1.20, EL 0.24, PW 1.00.
Paratype minor: HW 0.64, HL 0.82, SL 1.04, EL 0.14, PW 0.44.

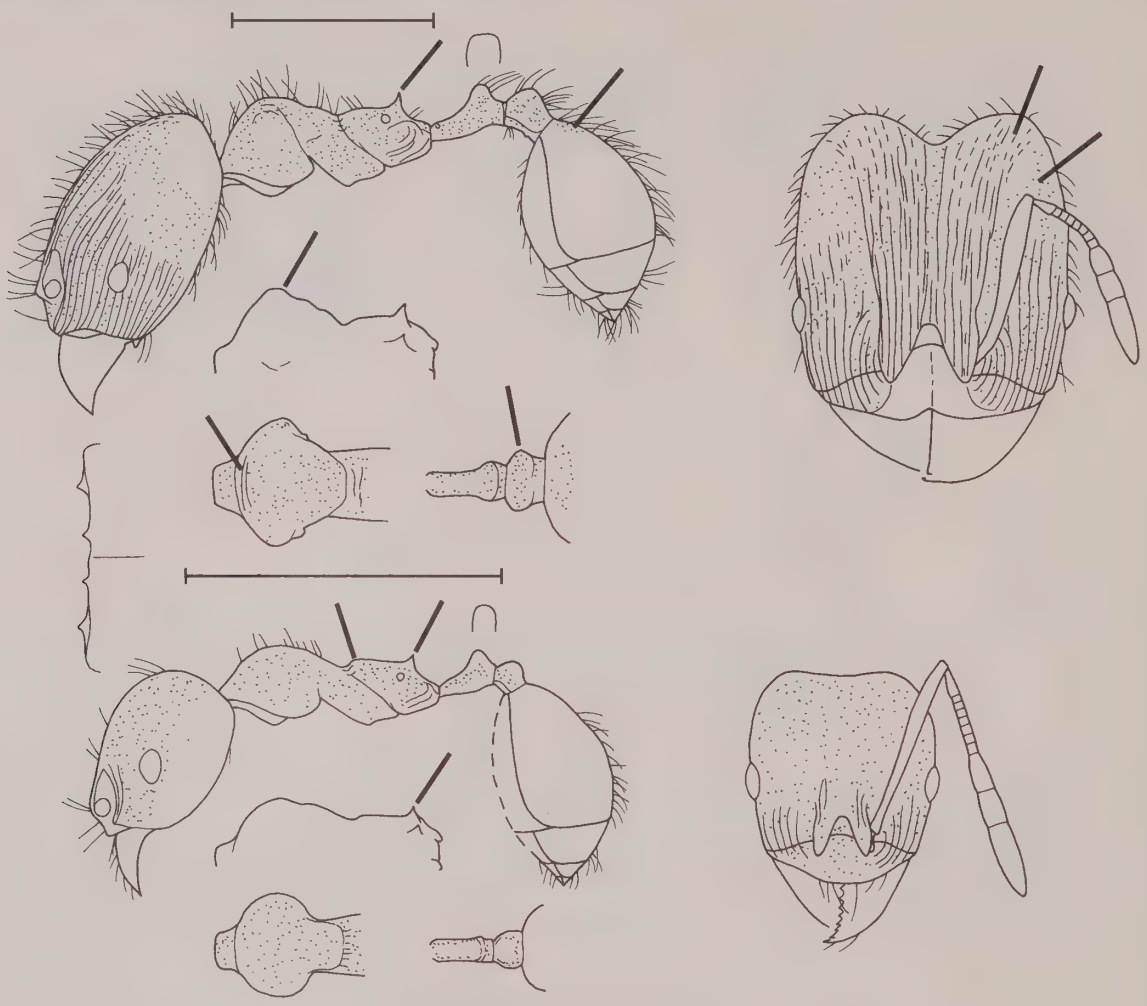
COLOR Major: head and appendages light reddish brown, rest of body medium reddish brown.
Minor: yellowish brown.

RANGE Known only from the type series.

BIOLOGY The types were attracted to a tuna bait.

Compare with species listed in the Diagnosis below

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Madeira-Mamoré rail track; km 284, Rondônia (William M. Mann). Scale bars = 1 mm.



Pheidole carapuna Mann

Pheidole carapuna Mann 1916: 432. Syn.: *Pheidole carapuna* var. *chaquimayensis* Wheeler 1925a: 20, n. syn.

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Unknown.

DIAGNOSIS A small, brownish red (**major**) to yellow (**minor**) species belonging to a group of ambiguous species composing the "*carapuna* complex" *(boltoni, carapuna, cornicula, cuprina, eriophora, jivaro, manuana,* and *tristicula)*. All are relatively small in size, with the major possessing a reduced mesonotal convexity, as well as cephalic sculpturing that consists entirely of longitudinal carinulae extending to or almost to the occipital border seen in full-face view. All also have a minor with a broad, concave occiput, which lacks a collar.

Among these species, *P. carapuna* is close to *tristicula* (q.v.), distinguished in the **major** by its darker color, reduced pronotal carinulae and absence of carinulae in the posteriormost lateral quarters of the dorsal head surface seen in full-face view.

MEASUREMENTS (mm) Lectotype major: HW 1.08, HL 1.28, SL 0.60, EL 0.14, PW 0.60.

Paralectotype minor: HW 0.48, HL 0.52, SL 0.44, EL 0.08, PW 0.32.

COLOR Major: body and head a rich medium brownish red, gaster light brown.

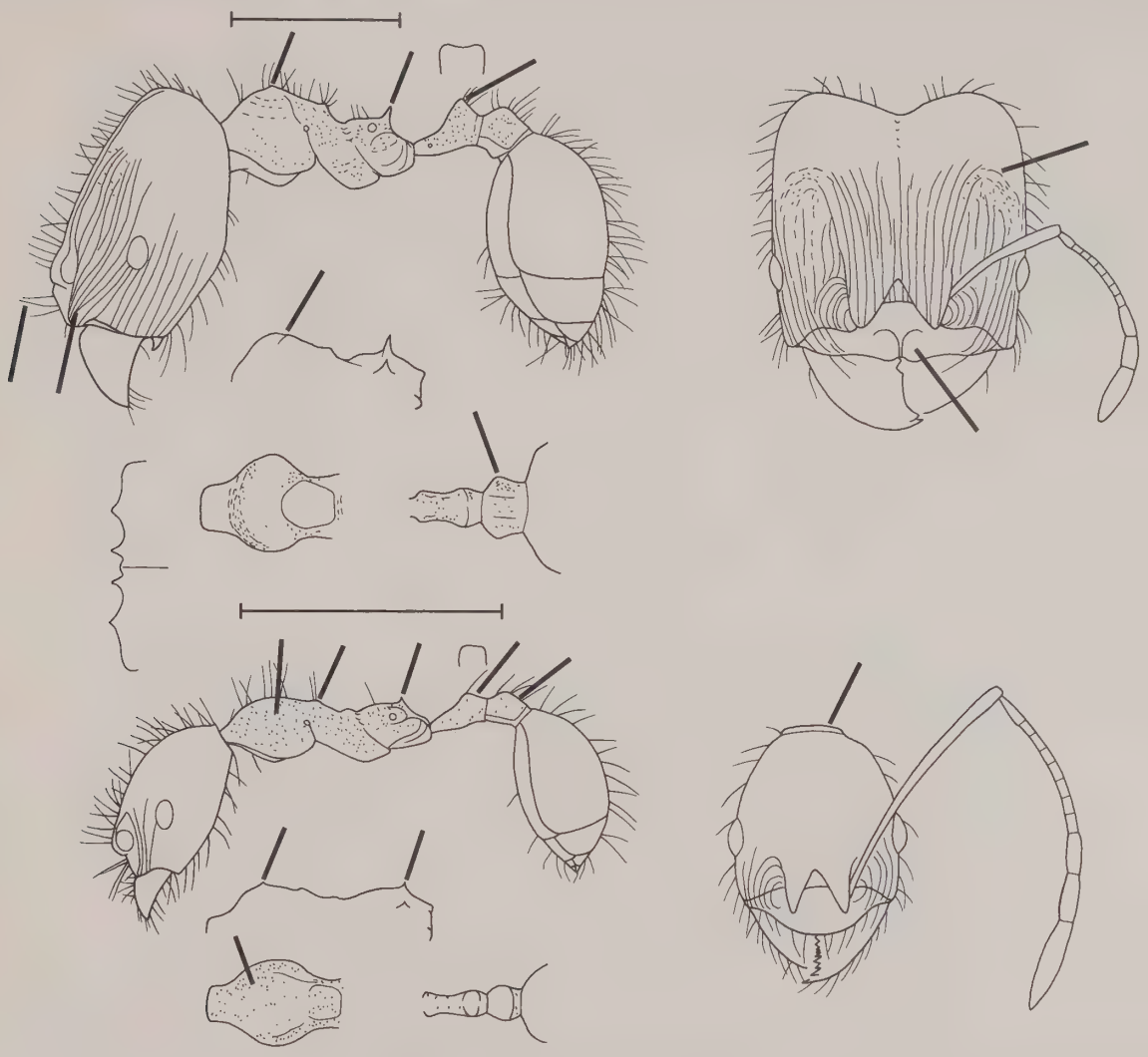
Minor: concolorous light yellow.

RANGE Amazonian Brazil and Peru north to Guyana, Venezuela, Colombia, Panama, and the southern Pacific lowlands of Costa Rica and Honduras.

BIOLOGY In Costa Rica, Longino (1997) found *carapuna* in lowland rainforest, where it nests and forages on and near the forest floor. In Costa Rica's Corcovado National Park, he discovered a nest under the bark of a rotten log, and elsewhere observed workers recruiting at night to a dead tabanid fly on a vertical tree trunk close to the ground.

Compare with species listed in the
Diagnosis below, especially *cornicula*

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (Leeanne E. Tennant-Alonso). Scale bars = 1 mm.



Pheidole celaena **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *celaena,* dark, referring to the body color.

DIAGNOSIS A medium-sized dark member of the *tristis* group, very close to and possibly synonymous with *cornicula,* also somewhat similar to *ambigua, amata, fera, germaini, peruviana, rogeri, rutilana, schwarzmaieri, superba,* and *vomer,* differing as follows.

Major: medium to dark reddish brown; a low angular process protrudes from center of clypeus in side view; mid-dorsal profile of pronotum in side view subangular; petiolar node tapers to a blunt point in side view; postpetiolar node from above roughly trapezoidal; carinulae originating on frontal lobes curve outward to the rear.

Minor: petiolar and postpetiolar nodes very low; humerus in dorsal-oblique view with small denticle; propodeal spines reduced to denticles; nuchal collar present.

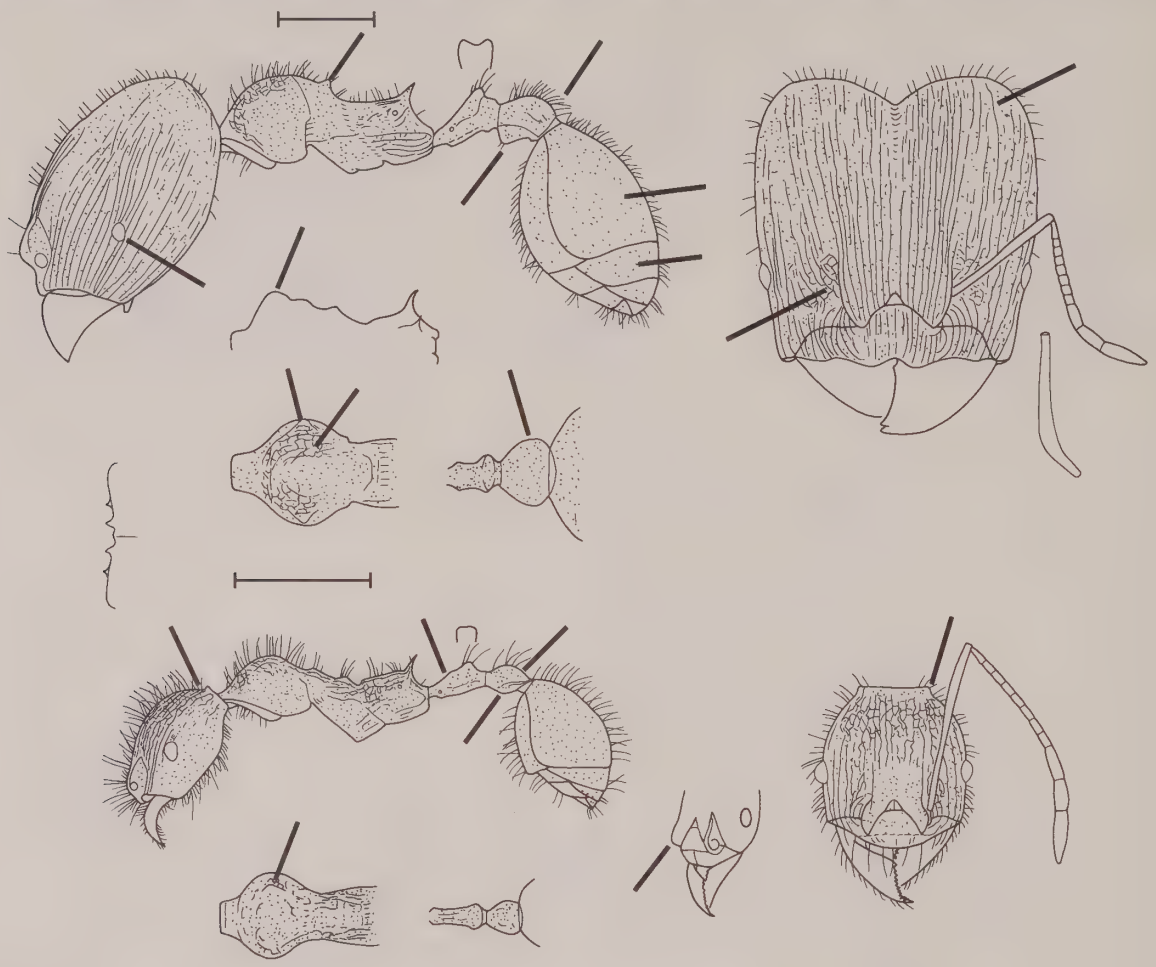
MEASUREMENTS (mm) Holotype major: HW 1.46, HL 1.66, SL 0.80, EL 0.16, PW 0.64.
Paratype minor: HW 0.56, HL 0.68, SL 0.82, EL 0.10, PW 0.38.

COLOR Major: head and mesosoma dark reddish brown, waist medium reddish brown, gaster light to medium brown, legs yellowish brown.
Minor: body concolorous plain brown; tarsi yellow; rest of appendages yellowish brown.

RANGE Known from the type locality in Costa Rica and from Kukra Hill, Nicaragua.

BIOLOGY Unknown.

FIGURE Upper: major. Lower: minor. BRAZIL: 90 km north of Manaus, Amazonas (E. O. Wilson). My drawings were compared with the types of *cephalica* by Barry Bolton. (Type locality: Tunantins, Amazonas, Brazil.) Scale bars = 1 mm.



Pheidole cephalica F. Smith

Pheidole cephalica F. Smith 1858a: 177. Syn.: *Pheidole opaca* Mayr 1862: 749, synonymy by Kempf 1965: 183; *Pheidole opaca* var. *incrusta* Forel 1908c: 59, n. syn.; *Pheidole opaca* subsp. *sacrita* Forel 1908c: 59, n. syn.; *Pheidole opaca* subsp. *apterostigmoides* Weber 1943b: 71, n. syn.

TYPES Nat. Hist. Mus. London.

ETYMOLOGY Gr *cephalica,* of the head, probably alluding to the enlarged head of the major.

DIAGNOSIS A very large, small-eyed species, immediately recognizable in the **major** by the low postpetiolar node in side view, prominent lobose subpostpetiolar process, broad, bell-shaped postpetiole seen from above, and completely foveolate body (including all of the gaster); and in the **minor**, by the very low petiolar and postpetiolar nodes, cylindrical overall shape of the petiole in side view, extended frontal lobes in dorsal-oblique view, occipital neck, and completely foveolate body (including all of the gaster).

MEASUREMENTS (mm) Major (north of Manaus, Brazil): HW 2.60, HL 2.66, SL 1.26, EL 0.26, PW 1.26.
Minor (north of Manaus, Brazil): HW 0.98, HL 1.06, SL 1.12, EL 0.16, PW 0.66.

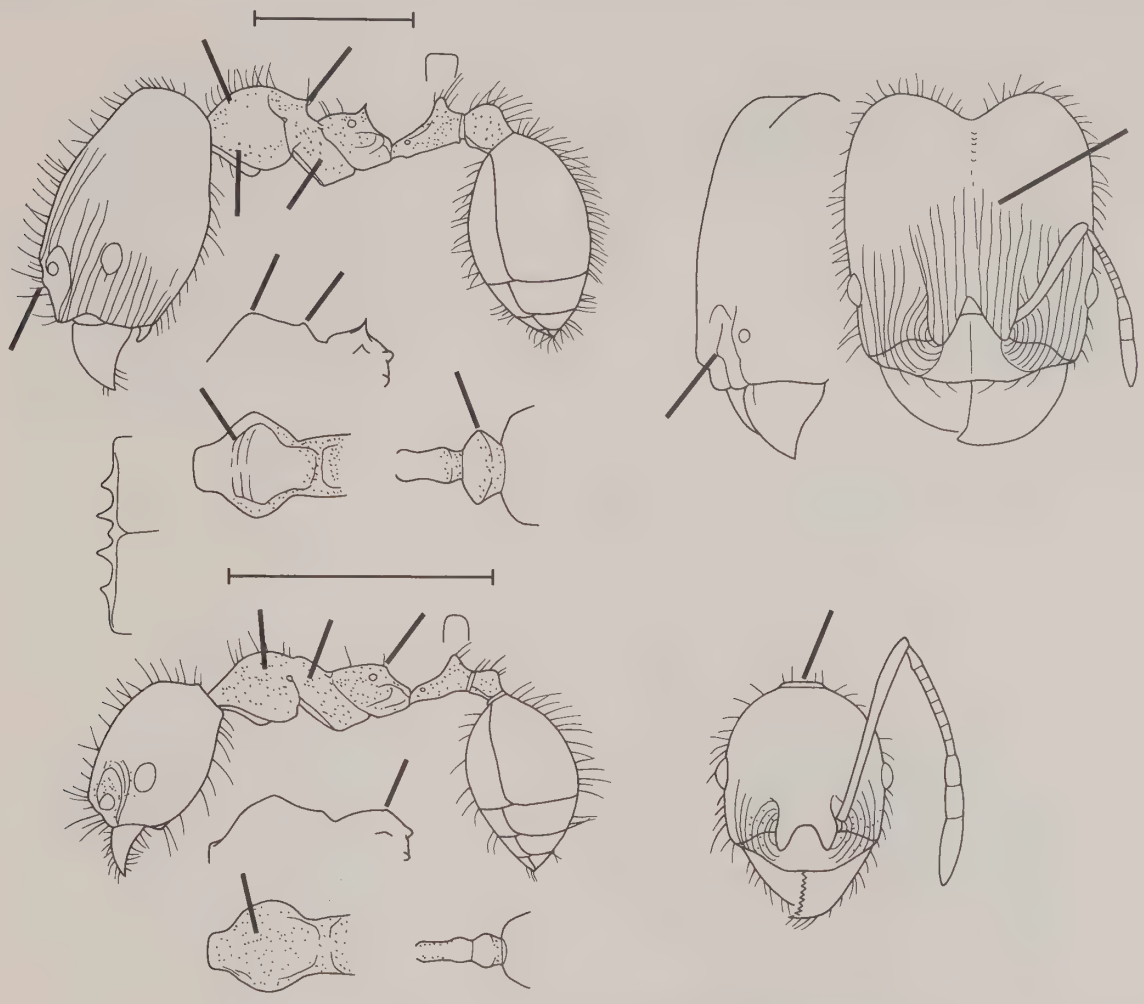
COLOR Major: body dark reddish brown.
Minor: body light reddish brown except for the gaster, which is yellowish brown.

RANGE A very widespread species recorded over many localities from Veracruz, Mexico, to Amazonian Brazil and Bolivia, where it is often locally abundant. I have collected it on Tobago, which appears to be its farthest intrusion into the West Indies. In Costa Rica, Longino (1997) reports finding the species from sea level to 900 m.

BIOLOGY *P. cephalica* is an inhabitant of tropical forests, particularly in lowland areas. Colonies nest in rotten logs, stumps, and even the dead branches of standing trees a meter or more off the ground. The minors forage widely over the forest floor and up onto the trunks of standing trees. They feed on insects, are attracted to sugar baits, and also collect seeds. Using laboratory colonies, I demonstrated the extreme sensitivity of minor workers to the appearance of standing water in the nest: at the first sign of potential flooding—even a few drops—the minors initiate trail laying and issue an alarm that causes the colony to evacuate the nest within minutes (Wilson 1987c).

Compare with *boltoni, carapuna, cuprina, jivaro, manuana, tristicula,* and especially *celaena*

FIGURE Upper: holotype, major. Lower: paratype, minor. BOLIVIA: Club Las Palmas, Santa Cruz (James C. Trager). Scale bars = 1 mm.



Pheidole cornicula **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *cornicula,* little horn (on the mid-clypeus).

DIAGNOSIS Similar to other members of the "*carapuna* complex" listed above, and especially with *celaena,* with which it may be synonymous.

Major: a small but conspicuous protrusion on the mid-clypeus; postpetiole from above conulate; propodeum, mesopleuron, and margins of mesonotum and pronotum foveolate; entire rear third of head smooth and shiny.

Minor: occiput narrowed, with thin nuchal collar; propodeal spines reduced to denticles in side view and to obtuse angles in dorsal-oblique view; all of mesosoma and sides of waist foveolate and opaque.

MEASUREMENTS (mm) Holotype major: HW 1.70, HL 1.88, SL 0.80, EL 0.22, PW 0.70.
Paratype minor: HW 0.54, HL 0.62, SL 0.66, EL 0.10, PW 0.34.

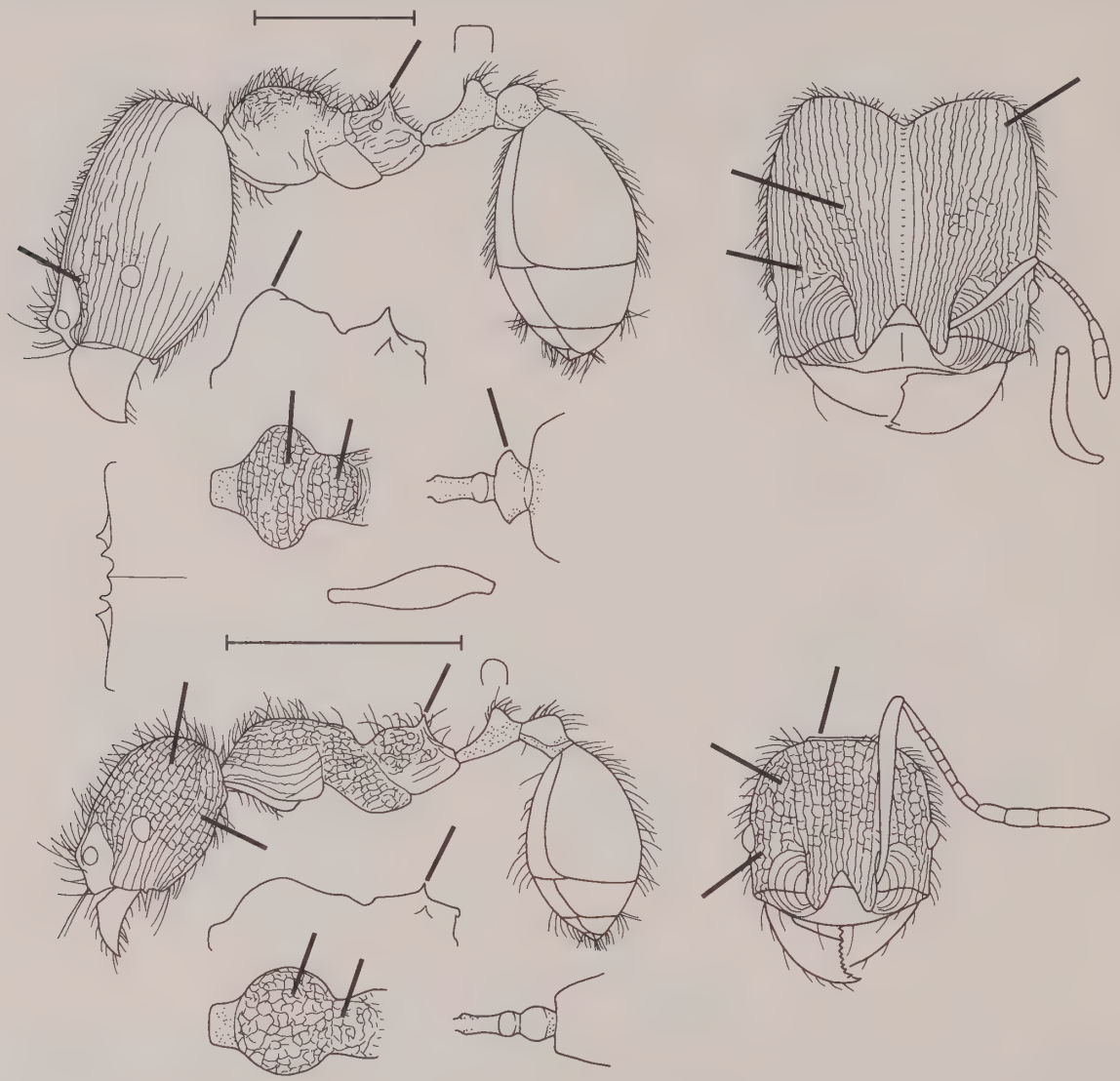
COLOR Major: head and mandibles reddish brown, rest of body medium yellowish brown, other appendages light yellowish brown.
Minor: body yellowish brown, appendages dark yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

Compare with *antillana, gauthieri, hetschkoi*

FIGURE Upper: holotype, major, hind femur included. Lower: paratype, minor. TRINIDAD: Windblow Ridge, Arima Valley, St. George Co., 550 m (Stefan Cover). Scale bars = 1 mm.



Pheidole coveri **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the accomplished collector, myrmecologist and field biologist Stefan Cover.

DIAGNOSIS Similar in various traits to *antillana, gauthieri,* and *hetschkoi,* differing as follows.

Major: mostly reddish yellow; all of promesonotum rugoreticulate; rugoreticulum on head extends from antennal fossa back to the outer portions of the vertex; rest of the dorsal surface of the head variously carinulate or rugulose; humerus in dorsal-oblique view elevated to 2× the height of the mesonotal convexity above the metanotal groove; postpetiole spinose.

Minor: most of head and mesosoma rugoreticulate, as illustrated; occiput broad and with thin nuchal collar; propodeal spines equilaterally triangular.

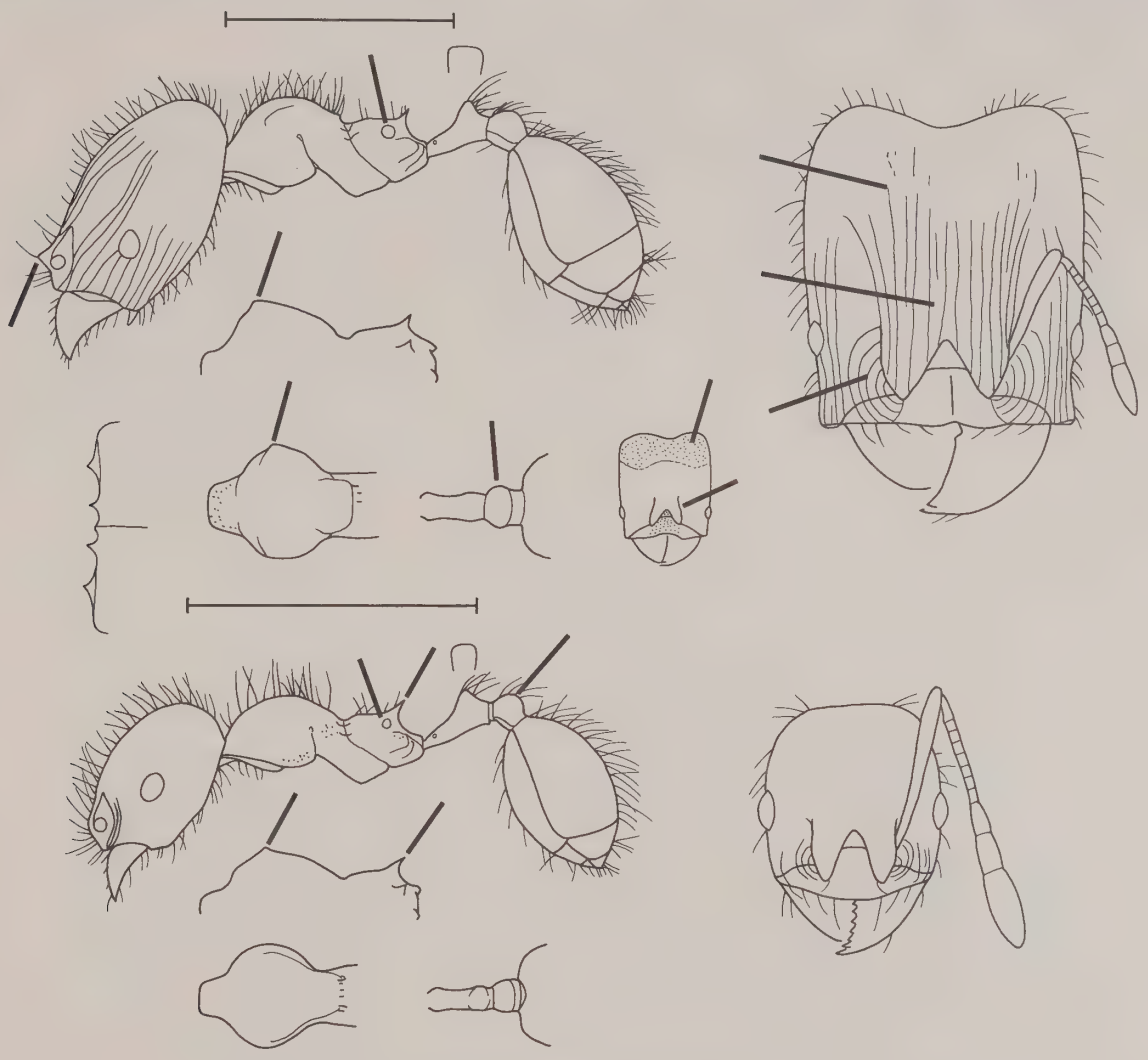
MEASUREMENTS (mm) Holotype major: HW 1.50, HL 1.60, SL 0.66, EL 0.14, PW 0.78.
Paratype minor: HW 0.66, HL 0.70, SL 0.64, EL 0.10, PW 0.46.

COLOR Major: most of body and appendages light reddish yellow ("orange"); mandibles, anterior rim of midclypeus, and all of lateral wings of clypeus plain medium brown; gaster light reddish brown.
Minor: concolorous light reddish yellow except for gaster, which is plain medium brown.

RANGE Known from the type locality, and from a series collected at El Espinal, near Michelena, Tachira, Venezuela (J. Lattke).

BIOLOGY Four of five colonies collected by Stefan Cover (personal communication) in the St. George County mountains of Trinidad were in mature montane rainforest and one was in secondary montane rainforest. All were nesting in rotten sticks on the forest floor. The colonies contained a single queen and fewer than 200 workers. One of the five nests contained a seed cache. In a colony maintained in an artificial nest by Cover, the minors defended the nest against fire ants *(Solenopsis invicta)* allowed to forage in the vicinity, but the large majors ("soldiers") hid inside the nest, leading Cover to feel some concern over having a species named in his honor that displays such a conspicuous degree of cowardly behavior. (Actually, he agreed that majors highly specialized to serve as seed millers often avoid combat.)

FIGURE Upper: syntype, major. Lower: syntype, minor. GUYANA: Kartabo (W. M. Wheeler). Scale bars = 1 mm.



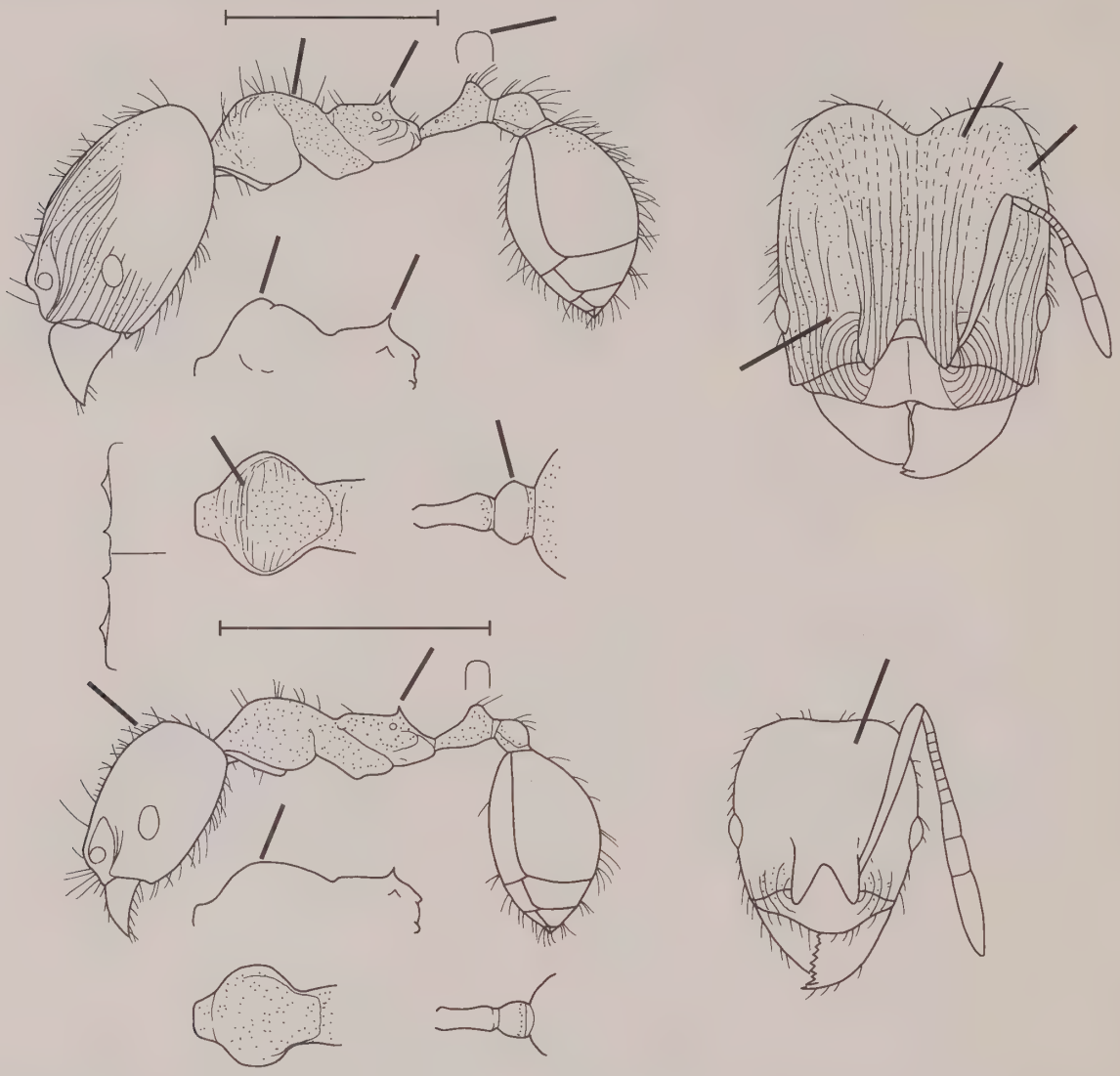
Pheidole cramptoni Wheeler

Pheidole cramptoni Wheeler 1916c: 4. Syn.: *Pheidole cramptoni* subsp. *petiolicola* Wheeler 1921f: 147, synonymy by Kempf and Brown 1968: 97.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Eponymous.
DIAGNOSIS Similar to *hasticeps, subarmata,* and especially *synarmata*.
Major: in side view frontal lobes project forward as equilateral triangles; humeri angulate, seen from above projecting slightly beyond the rest of the pronotum below it; propodeal spiracle very large, its diameter greater than the base of the propodeal spine in side view; postpetiole oval from above; head bicolored (see Color below); all of frontal lobes and space between frontal carinae filled with carinulae, which reach halfway from the level of the eyes to the level of the occiput.
Minor: propodeal spiracle large, about as wide as the base of the propodeal spine; humerus in dorsal-oblique view angulate; postpetiolar node from side well developed.
MEASUREMENTS (mm) Syntype major: HW 0.96, HL 1.20, SL 0.46, EL 0.10, PW 0.52.
Syntype minor: HW 0.52, HL 0.58, SL 0.52, EL 0.08, PW 0.32.
COLOR Major: anterior half of dorsum of head yellow, contrasting with yellowish brown posterior half, also with yellowish brown mid-clypeus, frontal triangle, and antennal fossae; body yellowish brown.
Minor: concolorous yellowish brown.
RANGE Recorded from Costa Rica; Trinidad; Guyana (type locality); Mato Grosso, Brazil; and Amazonian Brazil, Ecuador, and Peru.
BIOLOGY Longino (1997) found two colonies in primary rainforest on the Costa Rican Atlantic slope, one nesting in a rotting cavity of a live branch, the other in a dead stick. Douglas Yu (specimen data) discovered a colony in Peru in cavities of the myrmecophyte *Cordia nodosa*. Colonies have been found in rainforest nesting in dead sticks and in the cavities of live myrmecophytes of the genera *Cordia* and *Piper*. Winged reproductives have been collected in nests in different localities from April to November.

Compare with *boltoni, carapuna, cornicula, eriophora, jivaro, manuana, tristicula*

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Madre de Dios, 200 m (Stefan Cover). Scale bars = 1 mm.



Pheidole cuprina **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *cuprina,* of copper, referring to the color.

DIAGNOSIS A small, reddish yellow species belonging to a group of ambiguous species composing the "*carapuna* complex" (see list in heading above), close to the *flavens* group and possibly better placed there. All are relatively small in size, with the **major** possessing a reduced mesonotal convexity, as well as cephalic sculpturing that consists entirely of longitudinal carinulae extending to or almost to the occipital border seen in full face. All also have a minor with a broad, concave occiput, which lacks a collar. Among these species, *P. cuprina* is close to *carapuna* but distinguished from it by color and the absence of foveolation on the postpetiolar node of the **major** and posterior three-fourths of the dorsal head surface of the **minor**.

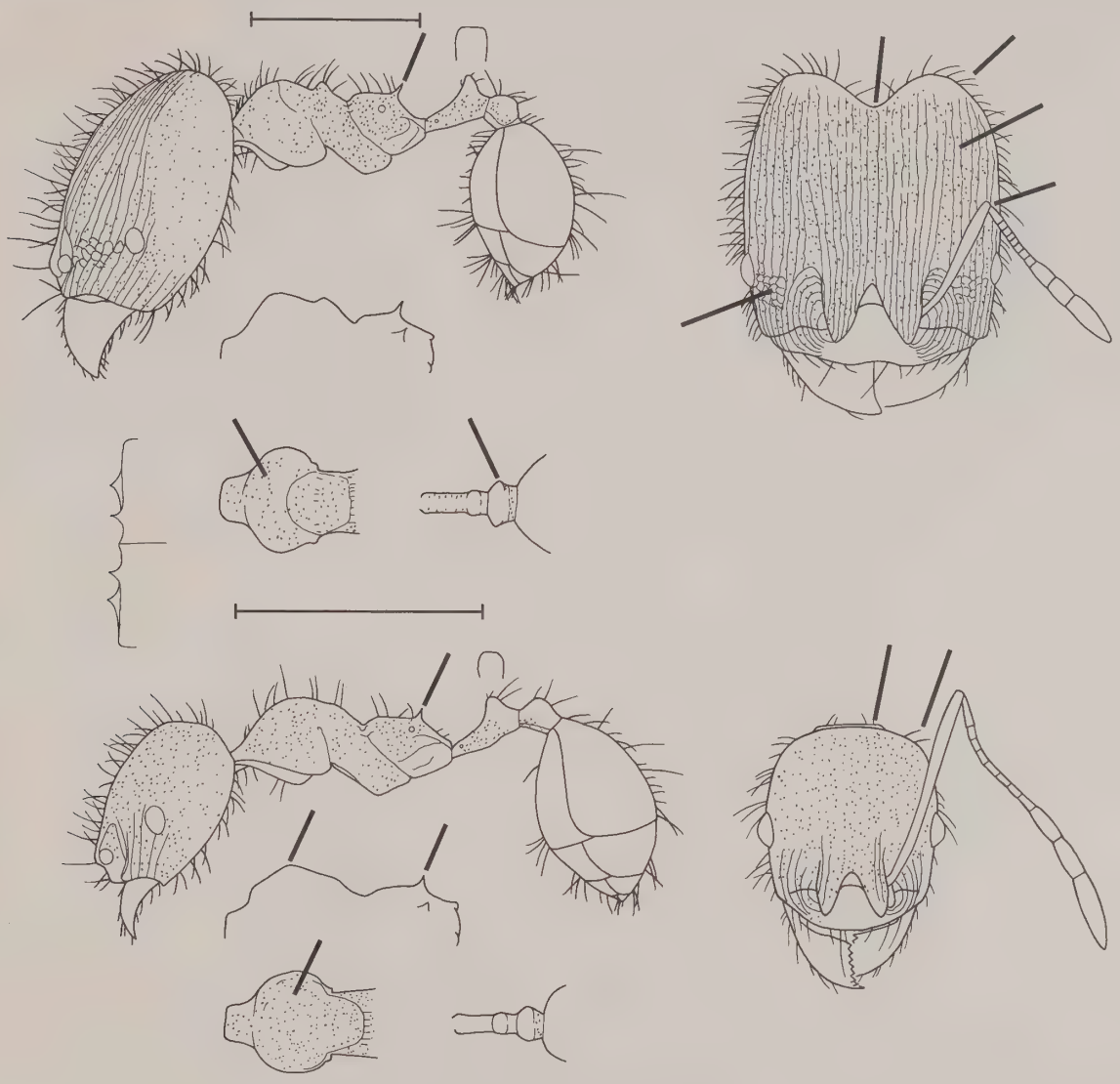
MEASUREMENTS (mm) Holotype major: HW 1.02, HL 1.16, SL 0.58, EL 0.16, PW 0.56.
Paratype minor: HW 0.60, HL 0.66, SL 0.56, EL 0.12, PW 0.38.

COLOR Major and minor: concolorous medium yellow, with slight reddish tinge.

RANGE I have seen an additional series of *cuprina* from Tingo Maria, Madre de Dios, Peru, collected by W. L. Brown.

BIOLOGY The type colony was found in terra firme forest nesting in a rotten branch on the litter surface of the ground. It comprised a single queen and several hundred workers (Stefan Cover, personal communication).

FIGURE Upper: lectotype, major. Lower: minor, not described by Forel but attached to lectotype major and evidently part of the type series. GUATEMALA: Purulha, Baja Verapaz. Scale bars = 1 mm.

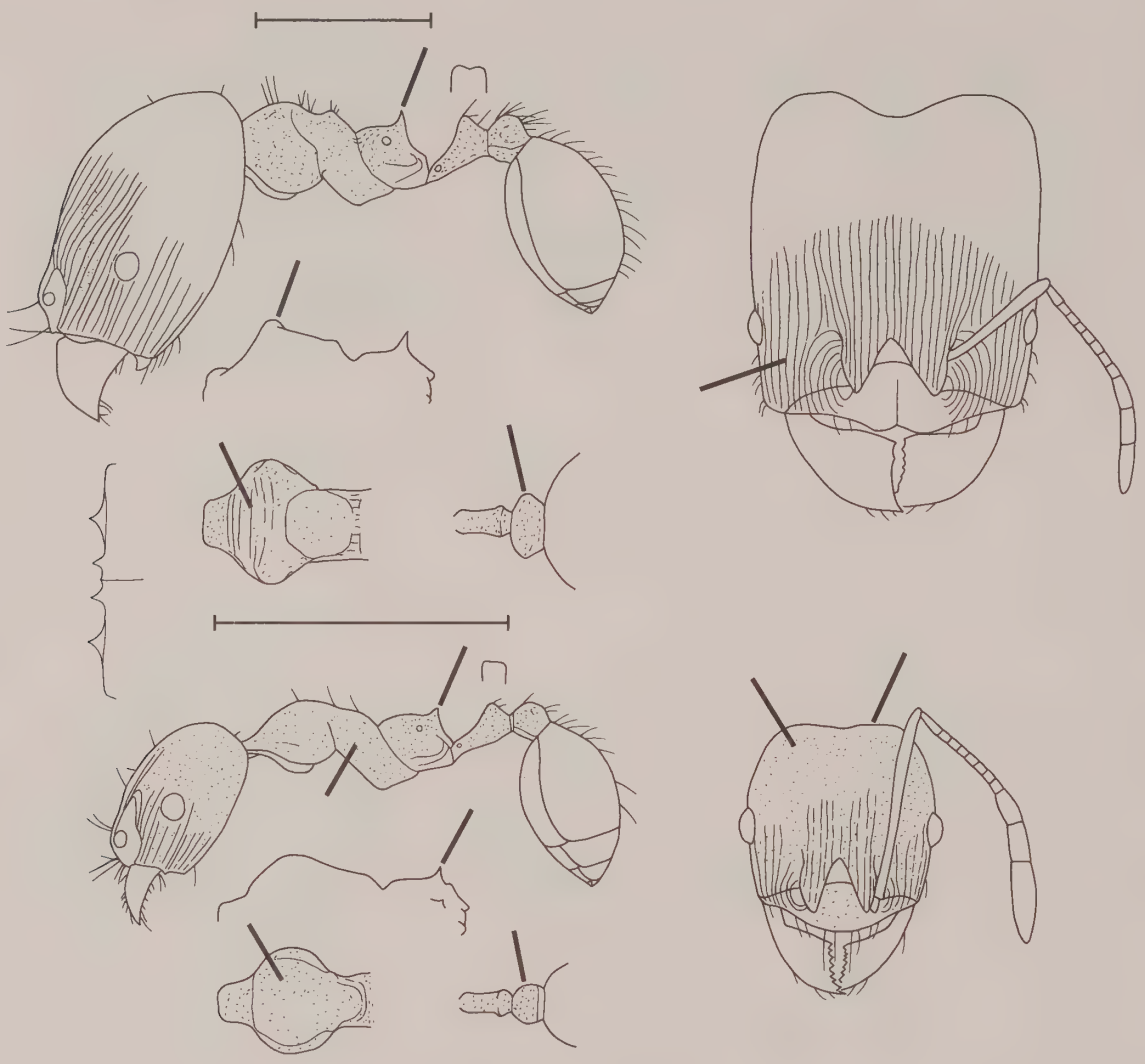


Pheidole deceptrix Forel

Pheidole deceptrix Forel 1899e: 66.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY L *deceptrix,* deceiver, allusion unknown.
DIAGNOSIS A medium-sized, brown species of uncertain affinities, distinguished as follows.
Major: head somewhat elongate, with a deep occipital cleft and subangulate corners, as illustrated, and dorsal surface longitudinally carinulate and foveolate except for occipital lobes, frontal triangle, and mid-clypeus; rugoreticulum extends from eye to antennal fossa on each side of head; all of mesosoma and sides of waist foveolate and opaque; propodeal spines thin; postpetiole seen from above elliptical and with angulate sides.
Minor: occiput not narrowed, yet possesses nuchal collar; all of head except frontal triangle and mid-clypeus and all of mesosoma foveolate and opaque; humeri in dorsal-oblique view subangulate; propodeal spines thin.
MEASUREMENTS (mm) Lectotype major: HW 1.46, HL 1.62, SL 0.80, EL 0.20, PW 0.66.
Minor in type series: HW 0.64, HL 0.74, SL 0.76, EL 0.12, PW 0.42.
COLOR Major: concolorous medium brown except for funiculus, which is yellowish brown.
Minor: body medium brown, appendages light to yellowish brown.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: major (Campo Limpo, São Paulo, Brazil; associated with minors that were compared with type minors). Lower: minor (Campo Limpo, São Paulo, compared with types, which are badly decomposed and fragmented). (Type locality: Apolinário Saravia, Salta, Argentina.) Scale bars = 1 mm.



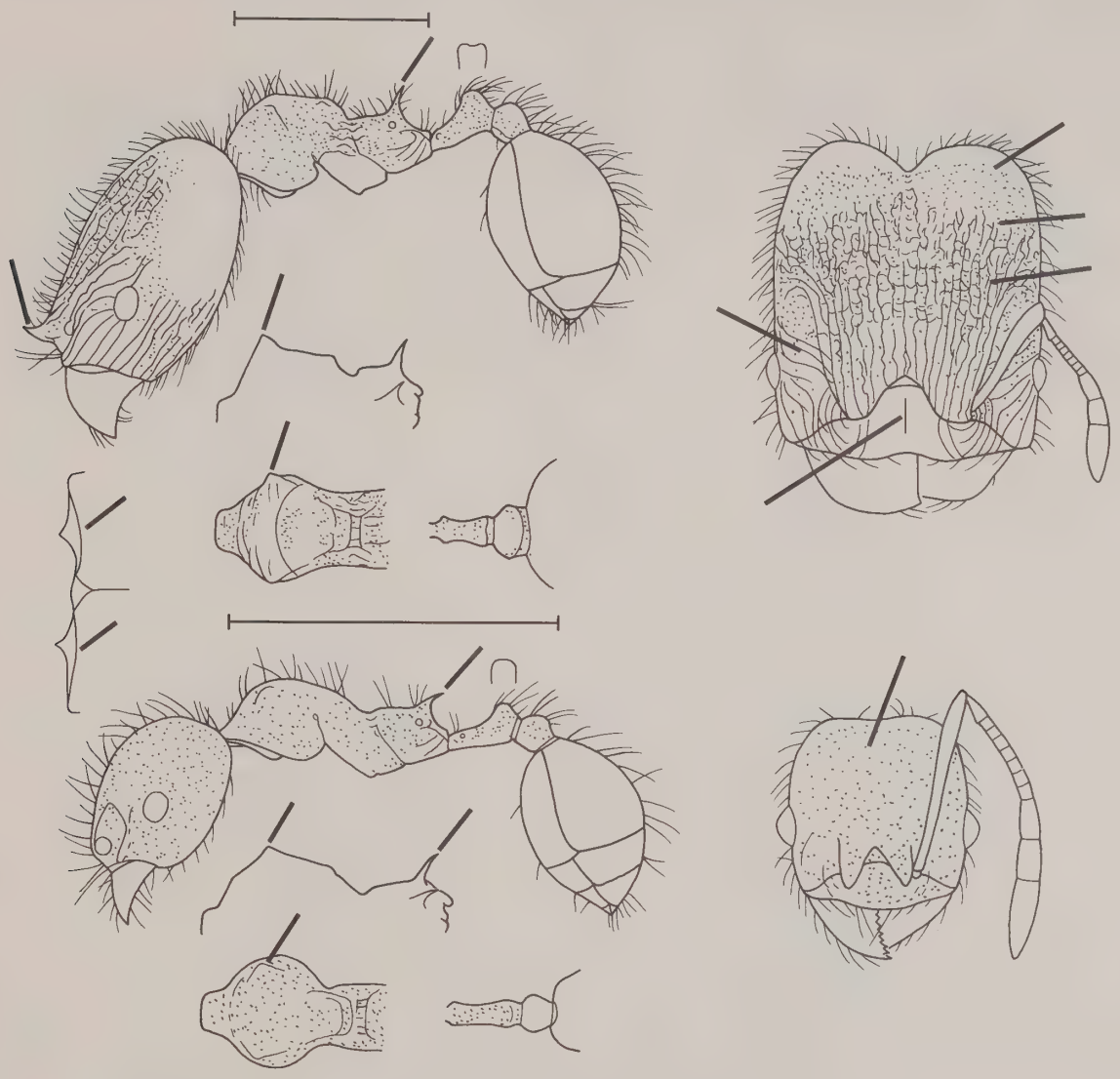
Pheidole descolei Kusnezov

Pheidole descolei Kusnezov 1952d: 76.

TYPES Mus. Comp. Zool. Harvard; Mus. Zool. Univ. São Paulo; Inst. Miguel Lillo Tucumán.
ETYMOLOGY Eponymous.
DIAGNOSIS A medium-sized, yellowish species of uncertain affinities.
Major: head moderately elongate, its anterior dorsal surface carinulate and with no rugoreticulum; pilosity sparse, nearly absent from margin of the head in full-face view; entire mesosoma and waist foveolate and opaque; humeri in dorsal-oblique view prominently raised and narrowly lobate; postpetiole from above elliptical.
Minor: occiput broad, lacking nuchal collar; entire head, mesosoma, and waist foveolate and opaque; pilosity sparse, largely absent from margin of head in full-face view.
The sparse pilosity in both castes may be due to decomposition.
MEASUREMENTS (mm) Major (Campo Limpo, São Paulo): HW 1.40, HL 1.54, SL 0.66, EL 0.20, PW 0.68.
Minor (Campo Limpo, São Paulo): HW 0.56, HL 0.62, SL 0.58, EL 0.10, PW 0.36.
COLOR Major: head and mandibles clear reddish yellow; mesosoma brownish yellow; gaster medium brown; antennae and legs clear dark yellow.
Minor: head medium yellowish brown; mesosoma, waist, and appendages light yellowish brown; gaster medium brown.
RANGE Known only from the localities in Argentina and Brazil cited above.
BIOLOGY Unknown.

Compare with *binasifer, gravida, mirabilis, moseni, nasifer, mosenopsis, rhinoceros, unicornis*

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Finca Los Guaduales, 10 km southwest of San José del Palmar, Rio Torito, Chocó (Charles Kugler). Scale bars = 1 mm.



Pheidole diabolus **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *diabolus,* devil, evil spirit.

DIAGNOSIS Similar in various respects to the species listed in the heading above, but strongly distinguished as follows.

Major: a sharp, upcurved horn grows from the center of the clypeus; humeri are very prominent, seen from above extending beyond the rest of the pronotum below, and in dorsal-oblique view forming a large equilateral triangle; propodeal spines more than half as long as the propodeal basal face; carinulae and rugulae on the frontal lobes give way posteriorly to a tight rugoreticulum, which then yields to a loose rugoreticulum, and next to foveolae, which finally are replaced by a smooth zone on the occiput.

Minor: all of head and mesosoma and most of waist foveolate; humeri angulate; propodeal spines half as long as the propodeal basal face and curved backwards.

MEASUREMENTS (mm) Holotype major: HW 1.18, HL 1.36, SL 0.54, EL 0.20, PW 0.64.
Paratype minor: HW 0.52, HL 0.54, SL 0.58, EL 0.12, PW 0.52.

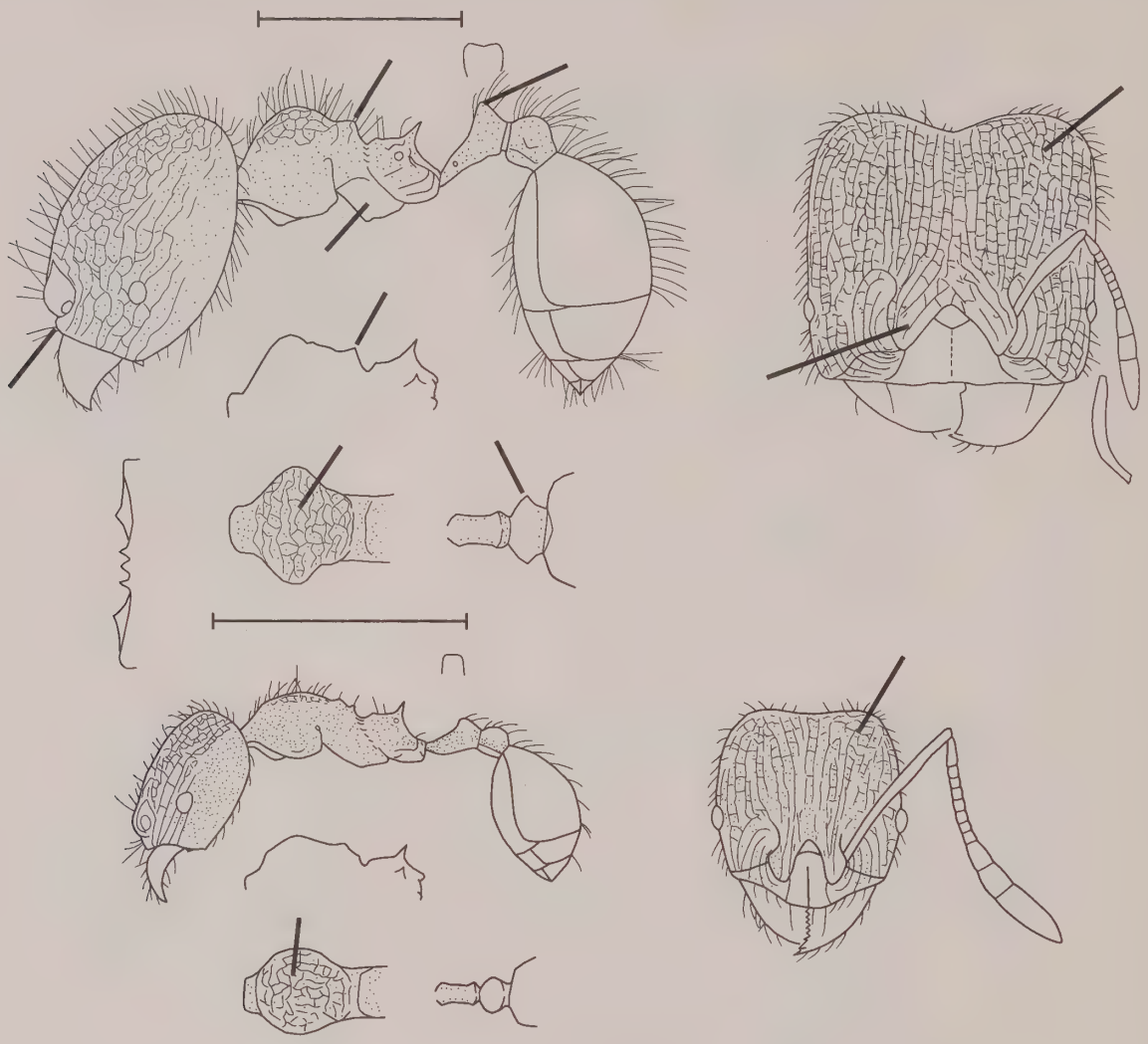
COLOR Major: body and mandibles medium reddish brown; other appendages yellow.
Minor: concolorous brownish yellow.

Range Known only from the type locality.

BIOLOGY The type colony, found on a forested mountain ridge, was nesting in a 4-cm-wide, rotten tree branch on the ground. A cache of seeds was present, as well as a male (1–4 June).

Compare with list of species
in the Diagnosis below

FIGURE Upper: major (Boraceia Biological Station, Salesópolis, São Paulo, 850 m, W. L. Brown) (compared by me with paratype). Lower: paratype, minor. (Type locality: Nova Teutonia, Brazil.) Scale bars = 1 mm.

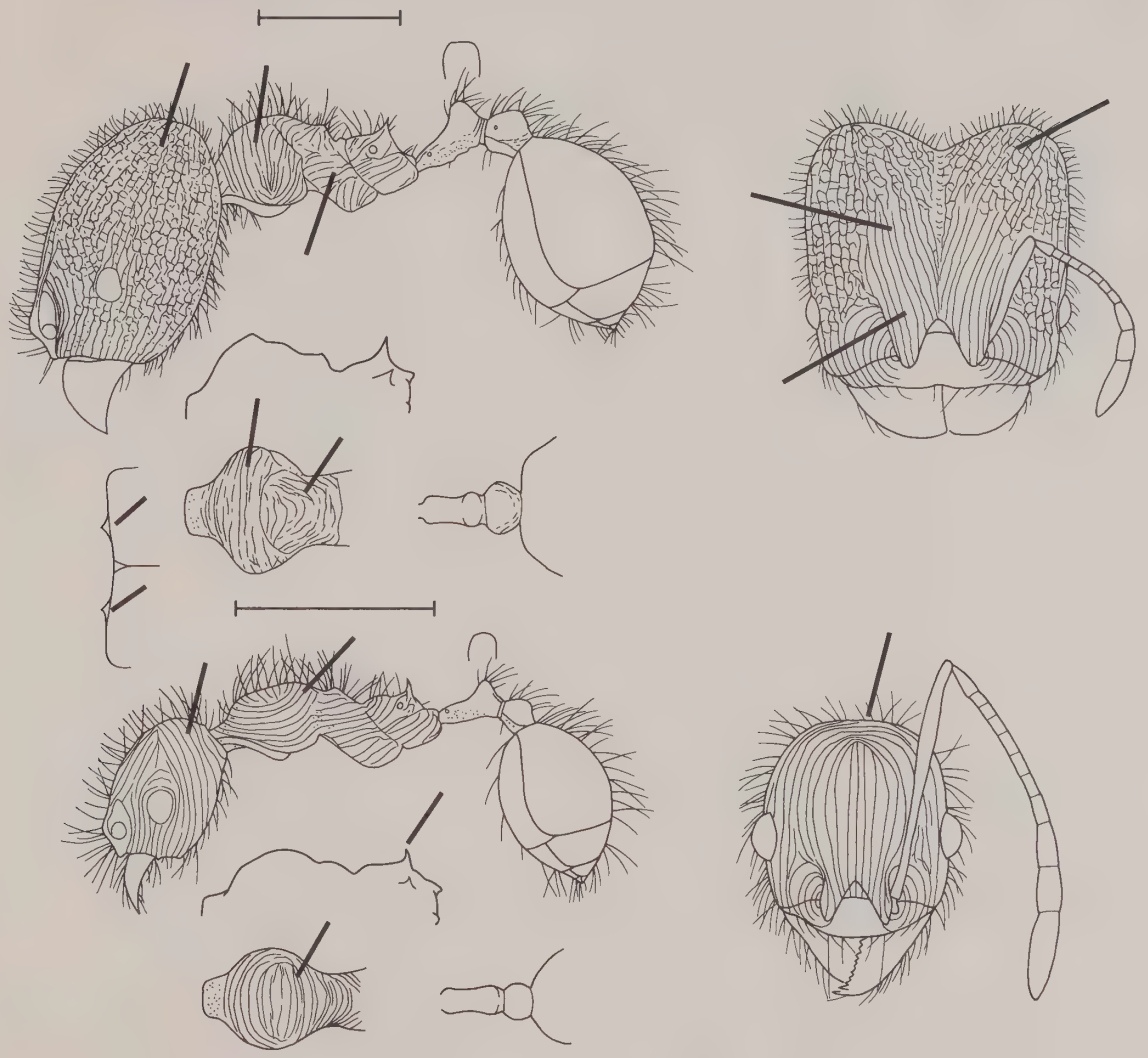


Pheidole dyctiota Kempf

Pheidole dyctiota Kempf 1972d: 451.

TYPES Mus. Zool. Univ. São Paulo; Mus. Comp. Zool. Harvard.
ETYMOLOGY Presumably from Gr *dictyo-,* pertaining to a net; i.e., the rugoreticulum of body surfaces.
DIAGNOSIS Similar in various ways to *aper, bambusarum, brevicona, laeviventris, lutzi, risii, rugatula, senilis, sigillata, trachyderma,* and *traini,* distinguished as follows.
Major: head transversely rectangular, with Head Width 1.1× Head Length; entire dorsal surface of head wholly rugoreticulate except for frontal triangle and mid-clypeus, which are smooth; main lines of rugoreticulum on frontal lobes oriented longitudinally, as illustrated; all of head and mesosoma foveolate except mesopleuron, which is smooth; mesonotal convexity subangulate; postpetiole seen from above cone-shaped.
Minor: almost all of dorsal head surface and promesonotal dorsum rugoreticulate.
MEASUREMENTS (mm) Paratype major: HW 1.16, HL 1.08, SL 0.42, EL 0.06, PW 0.60.
Paratype minor: HW 0.58, HL 0.58, SL 0.46, EL 0.08, PW 0.38.
COLOR Major: dark reddish brown; appendages medium reddish brown.
Minor: body and mandibles dark reddish brown, almost black; appendages brownish yellow.
RANGE Known only from the state of São Paulo, Brazil.
BIOLOGY Occurs in rainforest.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Rio Toro Amarillo, near Guápiles (William L. Brown). Scale bars = 1 mm.



Pheidole ectatommoides **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *ectatommoides,* referring to the distinctive sculpturing of the minor especially, reminiscent of ectatommoid ponerine ants.

DIAGNOSIS A highly distinctive species with some resemblance to *arietans, glyphoderma,* and *triumbonata,* but instantly recognizable by the unique pattern of sculpturing, especially on the **minor** worker, as illustrated.

MEASUREMENTS (mm) Holotype major: HW 1.98, HL 2.12, SL 0.90, EL 0.24, PW 0.86.
Paratype minor: HW 0.74, HL 0.80, SL 0.84, EL 0.20, PW 0.50.

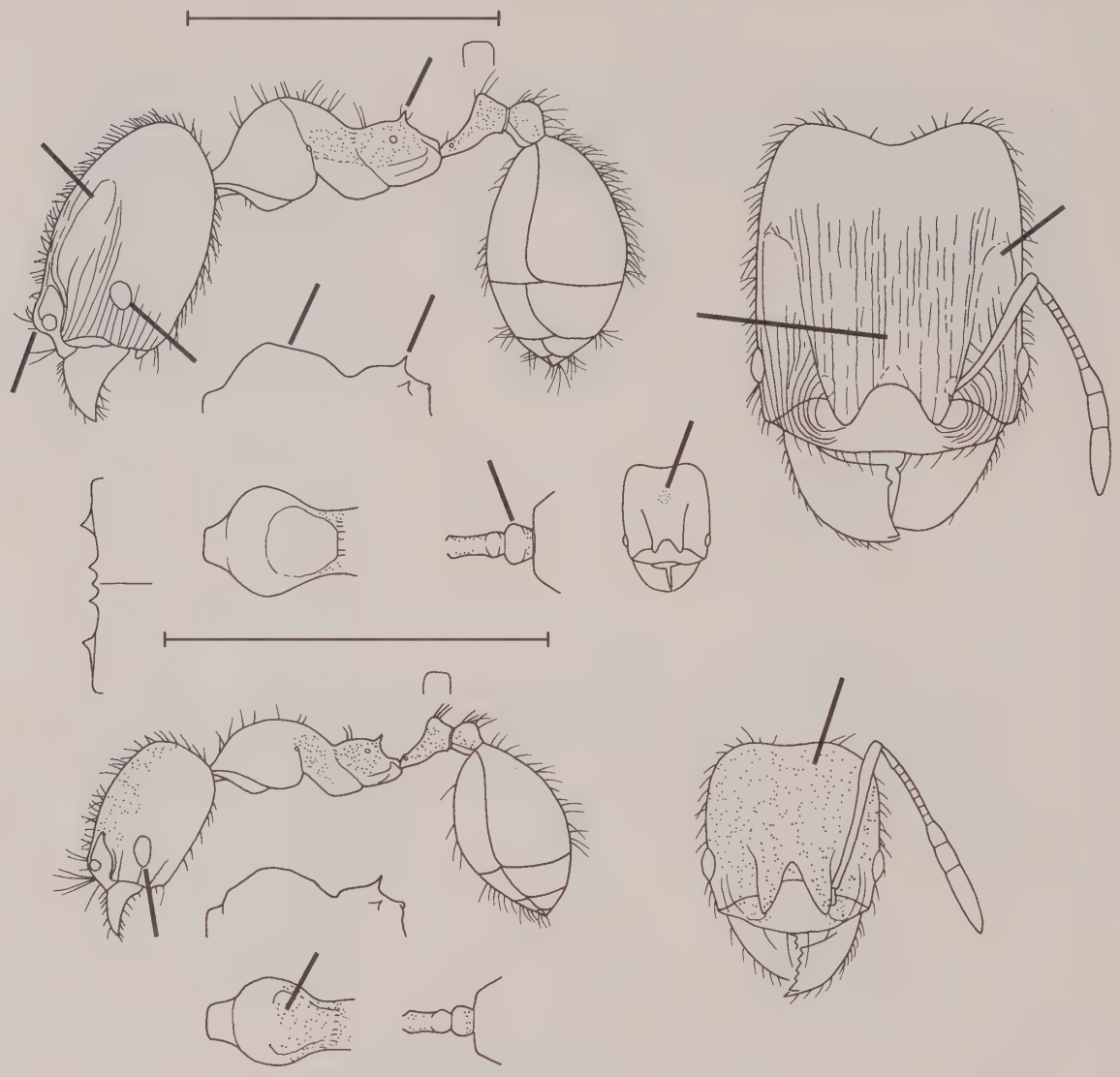
COLOR Major: head, mesosoma, and waist light reddish brown; appendages and gaster reddish yellow.
Minor: head and mesosoma reddish yellow; waist, gaster, and appendages plain medium yellow.

RANGE Recorded from Costa Rica, Panama, Colombia, and Ecuador. J. T. Longino (1997) found the species in Costa Rica on the Atlantic slope.

BIOLOGY Longino (1997) discovered workers foraging at night on the ground and on a fallen branch in a forest. At several localities across the range, caches of seeds have been found in the nests.

Compare with *cramptoni, hasticeps, subarmata, synarmata*

FIGURE Upper: holotype, major. Lower: paratype, minor. VENEZUELA: Rancho Grande, Estado Aragua, 1100 m (William L. and Doris E. Brown). Scale bars = 1 mm.



Pheidole eparmata **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *eparmata,* armed upon or in addition to, in reference to the similarity to *subarmata* and related species.

DIAGNOSIS **Major**: somewhat similar to *subarmata* and related species (see under *subarmata*), but very small, with frontal lobes less extended in side view; shallow antennal scrobes present; head bicolored (see under Color below); eyes set well forward, so that their distance from the anterior genal border is only slightly more than an Eye Length; postpetiole seen from above oval; all of frontal lobes covered by carinulae, which extend more than halfway from level of eyes to level of occiput.

Minor: eye placed well forward on head, such that distance to anterior genal border is less than an Eye Length.

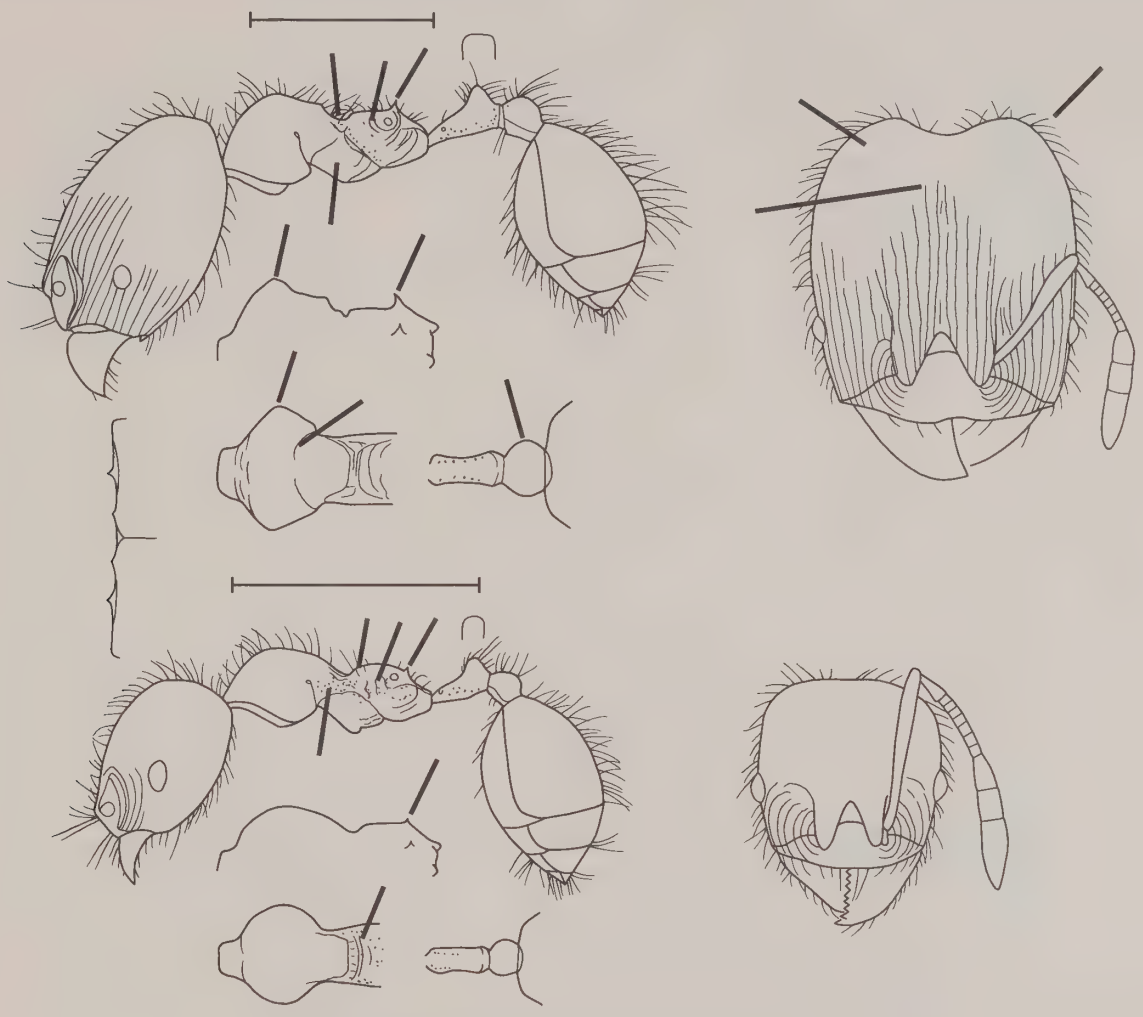
MEASUREMENTS (mm) Holotype major: HW 0.62, HL 0.76, SL 0.36, EL 0.08, PW 0.34.
Paratype minor: HW 0.40, HL 0.44, SL 0.34, EL 0.06, PW 0.24.

COLOR Major and minor: brownish yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Pance, Mun. de Cali, Valle, 1700 m (William L. Brown and S. Chaplin). Scale bars = 1 mm.

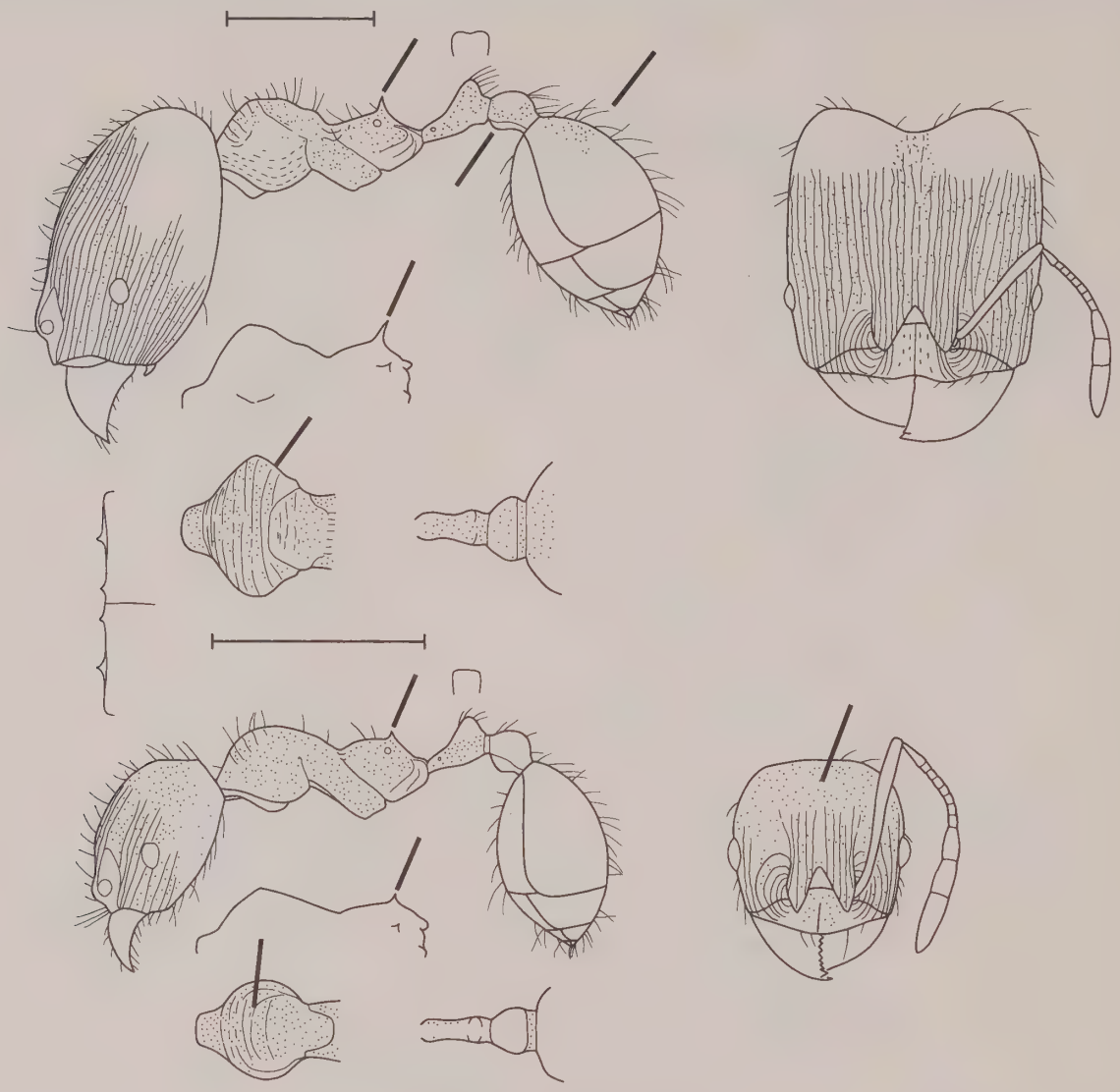


Pheidole eriophora **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *eriophora,* wool-bearing, alluding to the curving, wool-like pilosity of the mesosoma.
DIAGNOSIS Somewhat similar to the species ("*carapuna* complex") listed in the heading above.
Major: reddish yellow; occiput narrowed, giving the head capsule plus mandibles an overall elliptical shape in full-face view; some hairs on dorsal surfaces of head curved, giving a locally woolly look to the pilosity; humerus prominent, subangulate from above; propodeal spines vertical; postpetiole from above oval; most of posterior third of head, including occiput, smooth and shiny.
Minor: propodeal dorsum transversely carinulate; sides of propodeum with scattered short rugulae; upper mesopleuron foveolate; propodeal spines reduced to denticles.
MEASUREMENTS (mm) Holotype major: HW 1.12, HL 1.26, SL 0.60, EL 0.14, PW 0.64.
Paratype minor: HW 0.58, HL 0.62, SL 0.52, EL 0.08, PW 0.40.
COLOR Major: body and mandibles reddish yellow, legs and antennae plain medium yellow.
Minor: body and mandibles plain brownish yellow, legs and antennae plain medium yellow.
RANGE Known only from the type locality.
BIOLOGY The type colony was collected in montane rainforest.

Compare with species listed
in the Diagnosis below

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. COSTA RICA: San José. Scale bars = 1 mm.

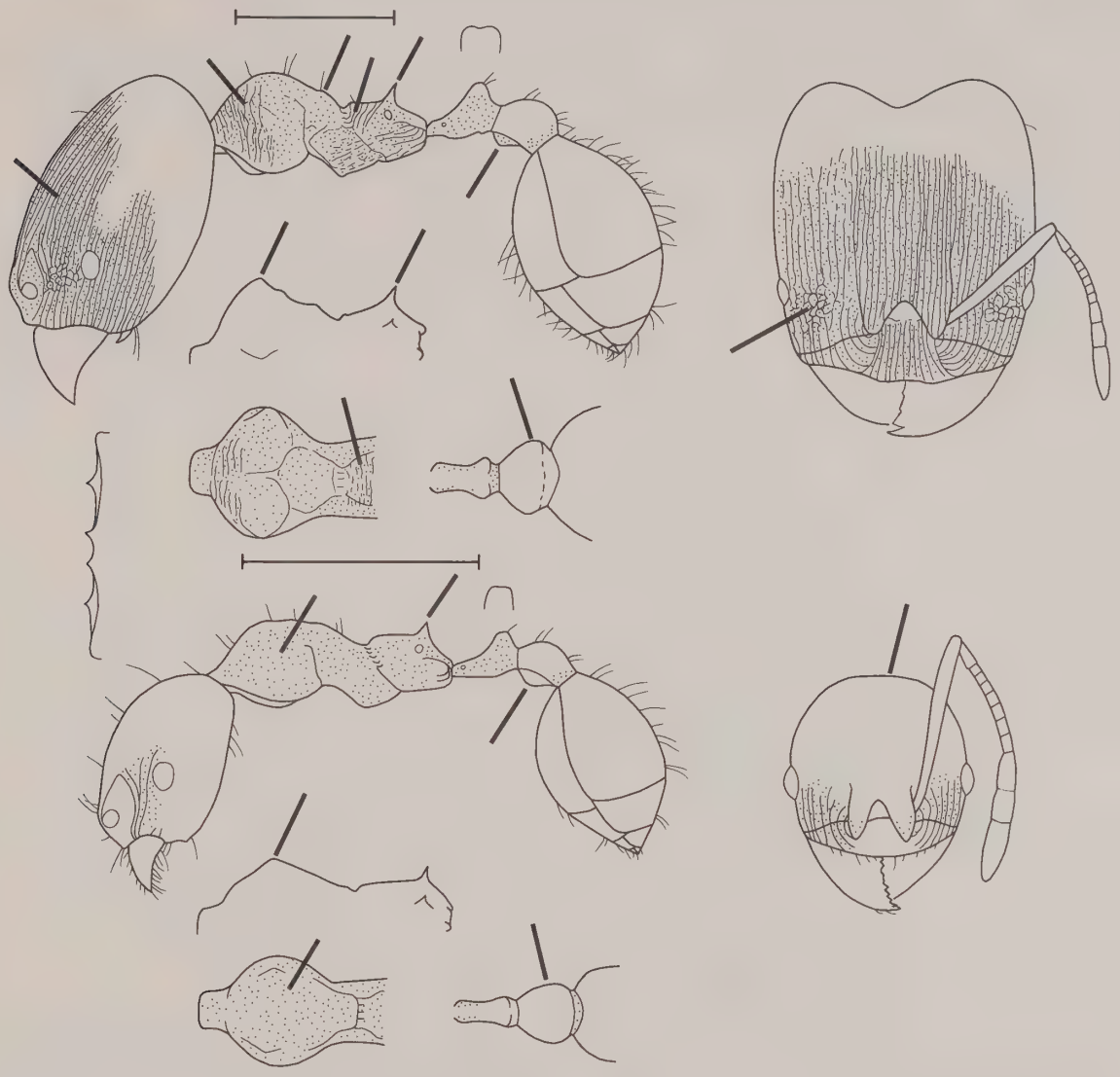


Pheidole exarata Emery

Pheidole exarata Emery 1896g: 68.

TYPES Mus. Civ. Stor. Nat. Genova.
ETYMOLOGY Unknown.
DIAGNOSIS A large, medium brown (**major**) or plain light brown (**minor**) member of the *tristis* group with small propodeal spines, possessing as well a subpostpetiolar process and bell-shaped postpetiolar node.
Major: all of dorsal head surface covered by parallel longitudinal carinulae; and pronotal dorsum by transverse carinulae.
Minor: occiput broad, lacking a nuchal collar; all of dorsal surface of head and mesosoma foveolate and opaque.
Similar to *alpinensis, excubitor, germaini, grandinodus, grantae, obrima, rogeri, stulta, tristis,* and *zoster,* differing in many details of body form, sculpturing, and pilosity, as illustrated, and in color, as described.
MEASUREMENTS (mm) Lectotype major: HW 1.60, HL 1.78, SL 0.86, EL 0.20, PW 0.80.
Paralectotype minor: HW 0.80, HL 0.86, SL 0.78, EL 0.14, PW 0.50.
COLOR Major: concolorous medium reddish brown.
Minor: concolorous plain light brown.
RANGE Known from the type locality and from Reserva Naturale, El Guayaba, Cali-Popayán, Cauca, Colombia, 1600 m (W. L. Brown and R. Root).
BIOLOGY The Colombian colony, with a winged queen, was found in montane rainforest on 24 March.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Pueblo Nuevo, Heredia, 150 m (John T. Longino). Scale bars = 1 mm.



Pheidole excubitor **new species**

TYPES INBio.

ETYMOLOGY L *excubitor,* guard, sentinel.

DIAGNOSIS A large, striking, bicolored member of the *tristis* group, with both **major** and **minor** possessing short, sparse, erect pilosity and a prominent humerus that rises far above the relatively flat promesonotum in dorsal-oblique view. Mesonotal convexity greatly reduced in **major** and absent in **minor**. In both castes, postpetiolar node seen from above bell-shaped, and prominent rounded postpetiolar process present.

Similar to *alpinensis, exarata, germaini, grandinodus, grantae, obrima, rogeri, severini, stulta, tristis,* and *zoster,* differing in many details of body form, sculpturing, and pilosity as illustrated, and in color.

MEASUREMENTS (mm) Holotype major: HW 1.56, HL 1.74, SL 0.84, EL 0.20, PW 0.80.

Paratype minor: HW 0.70, HL 0.74, SL 0.76, EL 0.16, PW 0.46.

COLOR Major: waist and gaster blackish brown, contrasting with the yellowish red of the remainder of the body; appendages a darker shade of reddish yellow.

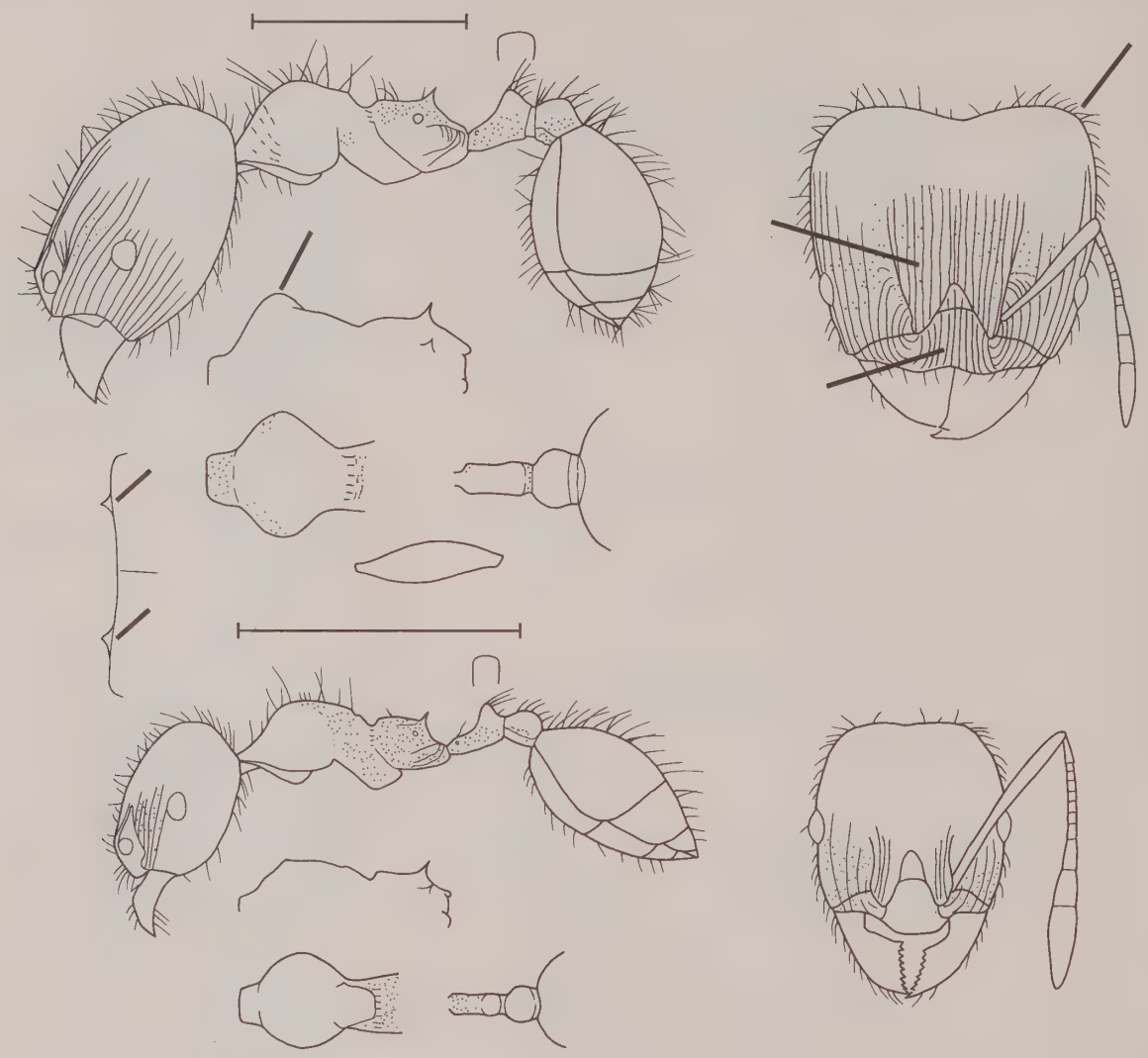
Minor: gaster medium brown, contrasting with the reddish yellow of the rest of the body and appendages.

RANGE Atlantic lowlands of Costa Rica (J. T. Longino 1997).

BIOLOGY Colonies nest beneath epiphytes in lowland rainforest (Longino 1997).

Compare with *balzani, nigella, tristis*

FIGURE Upper: syntype, major (Guanabara, Rio de Janeiro, Brazil). Lower: minor, associated with a major that was compared with syntype major (Reserva Floresta, Caraguatatuba, 40–80 m, São Paulo, Brazil; W. L. Brown). Scale bars = 1 mm.

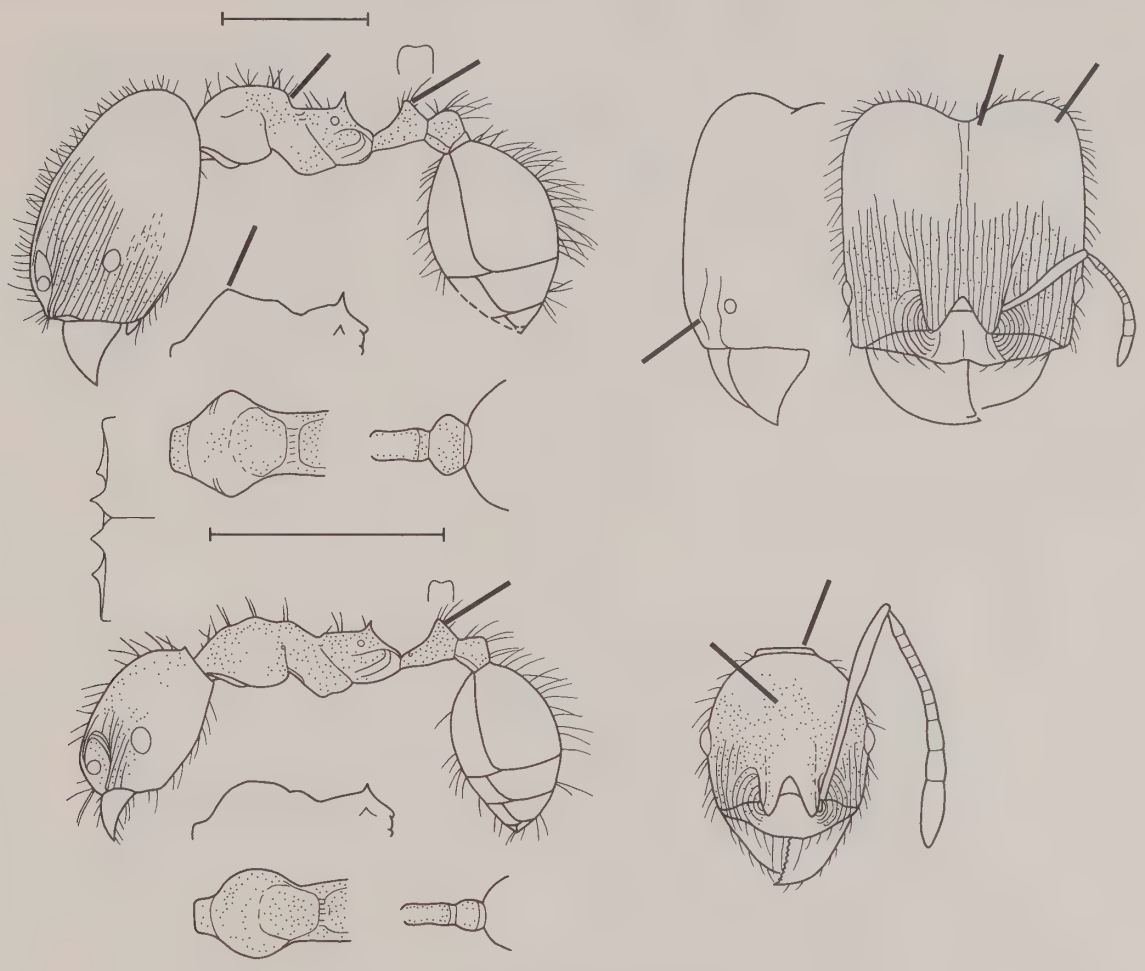


Pheidole fabricator (F. Smith)

Atta fabricator F. Smith 1858a: 167. Syn.: *Atta nigriventris* F. Smith 1858b: 169, synonymy by Brown 1981: 528; *Pheidole fabricatrix* Schulz 1906: 155, unjustified emendation. Raised to species level in this monograph: infraspecific forms *nigella, polita*.

TYPES Nat. Hist. Mus. London; Mus. Comp. Zool. Harvard.
ETYMOLOGY L *fabricator,* maker, builder.
DIAGNOSIS A member of the *tristis* group similar to *balzani, nigella,* and *tristis,* and distinguished from these and other species in the group by the following traits.
Major: hypostoma 2-toothed; Head Width greater than Head Length; head with mandibles tapering anteriorly, and overall heart-shaped; entire anterior dorsal half of head longitudinally carinulate, including frontal triangle and middle section of clypeus.
MEASUREMENTS (mm) Syntype major: HW 1.18, HL 1.12, SL 0.60, EL 0.14, PW 0.54.
Minor (Caraguatatuba, Brazil): HW 0.52, HL 0.56, SL 0.52, EL 0.12, PW 0.32.
COLOR Major: body reddish brown except for gaster, which is plain dark brown; appendages medium to dark brown.
Minor: head plain medium brown except for the genae, which are yellowish brown; mesosoma brownish yellow; gaster dark brown; appendages light brown.
RANGE In addition to the syntype from Rio de Janeiro, and series cited in the figure caption from São Paulo, I have seen a series of *fabricator* from Rancho Grande, Aragua, Venezuela, 1100 m (W. L. and D. E. Brown). Kempf (1972b) reports the species in addition from the state of Santa Catarina in Brazil. I have also examined the same or possibly a closely related species from near Belém, Pará, Brazil; and from the Guayabero River, Meta, Colombia.
BIOLOGY An inhabitant of rainforest. Males were present in a nest at Rancho Grande, Venezuela, during the time of collection, 23–27 June.

FIGURE Upper: lectotype, major (dorsal-oblique view of mesosoma and dorsal view of petiole based on paralectotype major). Lower: paralectotype, minor. BRAZIL: Minas Gerais. Scale bars = 1 mm.

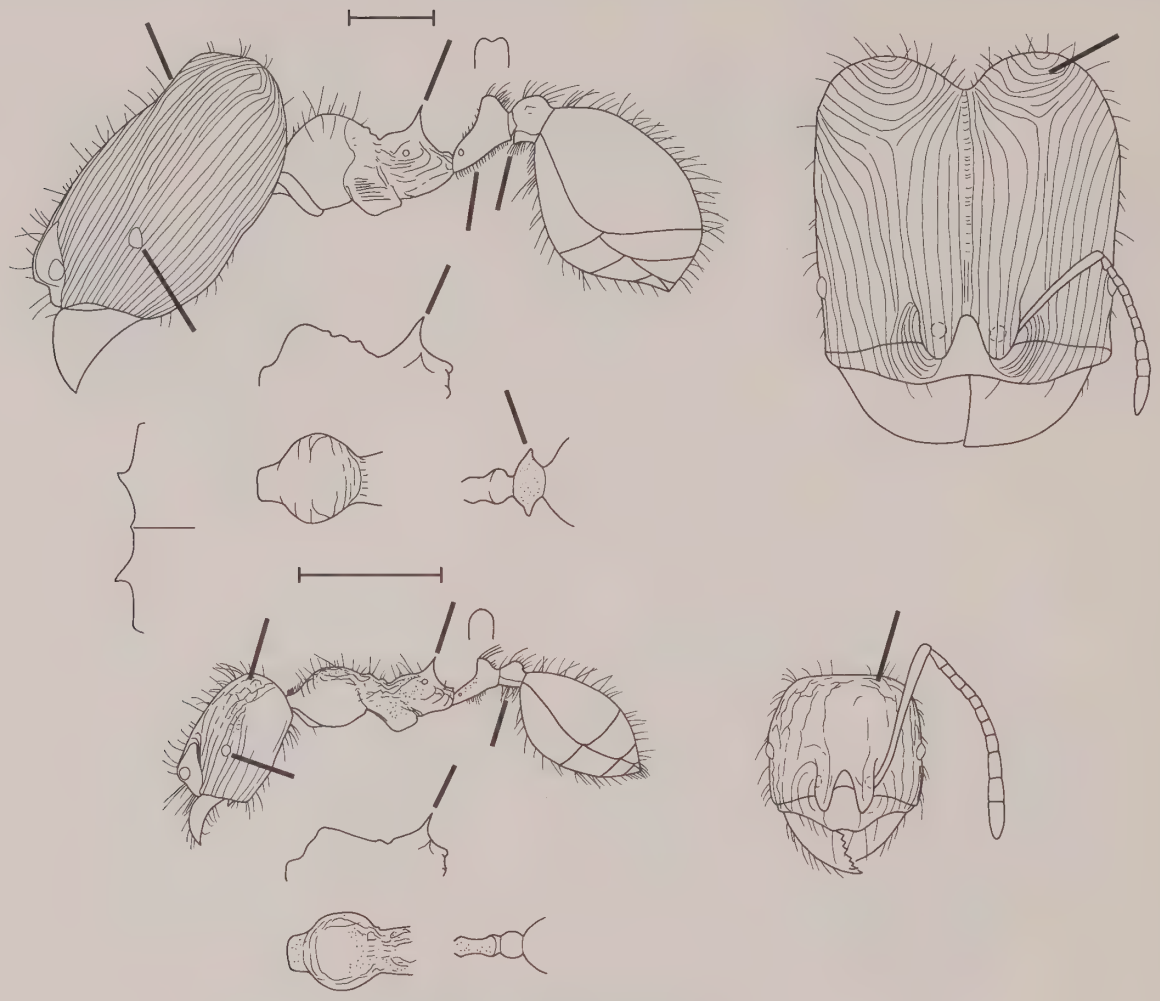


Pheidole fera Santschi, **new status**

Pheidole guilelmimuelleri var. *fera* Santschi 1925d: 227.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY L *fera,* wild, untamed.
DIAGNOSIS Similar in various traits to *amata, ambigua, celaena, germaini, peruviana, rutilana, schwarzmaieri, superba,* and *vomer,* differing as follows.
Major: distinct mesonotal convexity absent in side view, with promesonotal profile a continuous weakly convex curve that drops as a steep face to the metanotum; center of mid-clypeal carina projects forward as a process in dorsal-oblique view; posterior half of head smooth and shiny except for carinulae along the dorsal midline, which reach occiput; anterior half of head almost all carinulate, with no rugoreticulum; humeri subangulate in dorsal-oblique view; postpetiole diamond-shaped seen from above; apex of petiolar node acute in side view.
Minor: occiput narrowed, with a nuchal collar; apex of petiolar node acute in side view; central third of dorsum of head and almost all of mesosoma foveolate.
MEASUREMENTS (mm) Lectotype major: HW 1.96, HL 1.24, SL 0.94, EL 0.24, PW 0.76.
Paralectotype minor: HW 0.64, HL 0.74, SL 0.84, EL 0.14, PW 0.44.
COLOR Major: head and mandibles light reddish brown; rest of body plain medium brown; other appendages dark yellow.
Minor: body plain dark brown, appendages plain light brown.
RANGE Known only from Minas Gerais.
BIOLOGY Unknown.

FIGURE Upper: major. Lower: minor. BRAZIL: Benjamin Constant, Amazonas (W. L. Brown). (Type locality: "Rio Paraguay.") Scale bars = 1 mm.

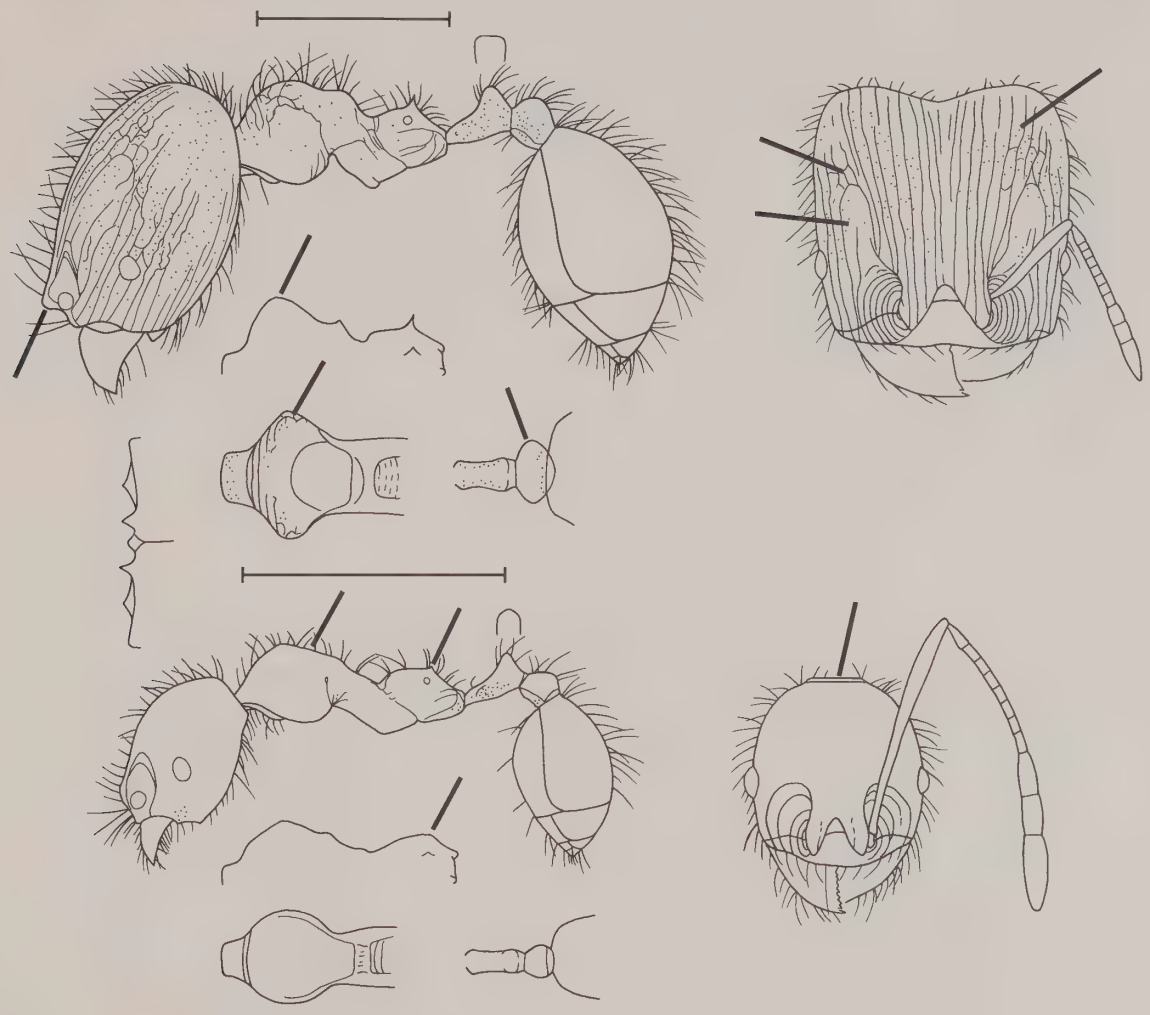


Pheidole fimbriata Roger

Pheidole fimbriata Roger 1863a: 196. Syn.: *Pheidole diversa* F. Smith 1860c: 74, synonymy by Kempf 1965: 183; *Pheidole smithii* Dalla Torre 1892: 90, unnecessary replacement name for *diversa,* junior synonym of *fimbriata*; *Pheidole fimbriata* var. *tucumana* Forel 1913m: 228, n. syn. (tentative; types not located); *Pheidole fimbriata* st. *tucumana* var. *loretana* Santschi 1934c: 30, unavailable name (quadrinomial).

TYPES Possibly either Mus. Naturkunde Humboldt-Univ. Berlin, or Paris Museum; not located in this study.
ETYMOLOGY L *fimbriata,* fringed, probably alluding to the pilosity on the venter of the waist.
DIAGNOSIS A very large, small-eyed species immediately recognizable in the **major** by the dense fringe of short, suberect to erect hairs on the petiolar peduncle and entire venters of the petiole and postpetiole; the concave profile of the posterior dorsum of the head in side view; the large, stout propodeal spines; and the spinose postpetiolar node.
Minor: very small eyes, angular humerus in dorsal-oblique view, and with a fringe of short hairs on venter of petiole.
MEASUREMENTS (mm) Major (Benjamin Constant, Brazil): HW 2.60, HL 2.88, SL 1.20, EL 0.20, PW 1.06.
Minor (Benjamin Constant): HW 0.84, HL 0.90, SL 0.84, EL 0.06, PW 0.52.
COLOR Major: medium to dark reddish brown.
Minor: concolorous brownish yellow.
RANGE One of the most widespread of all Neotropical ant species, recorded from Veracruz, Mexico, through Central and South America (including Trinidad) to Misiones, northern Argentina.
BIOLOGY An inhabitant of tropical forests. At La Selva, Costa Rica, Longino (1997) found large numbers of minors and majors foraging at night over the ground from a soil nest. An incipient colony was discovered in a dead stick on the forest floor.

FIGURE Upper: holotype, major. Lower: paratype, minor. ECUADOR: Sucua, 16 km south of Macas, 2°28′S 78°10′W (Gary Umphrey). Scale bars = 1 mm.

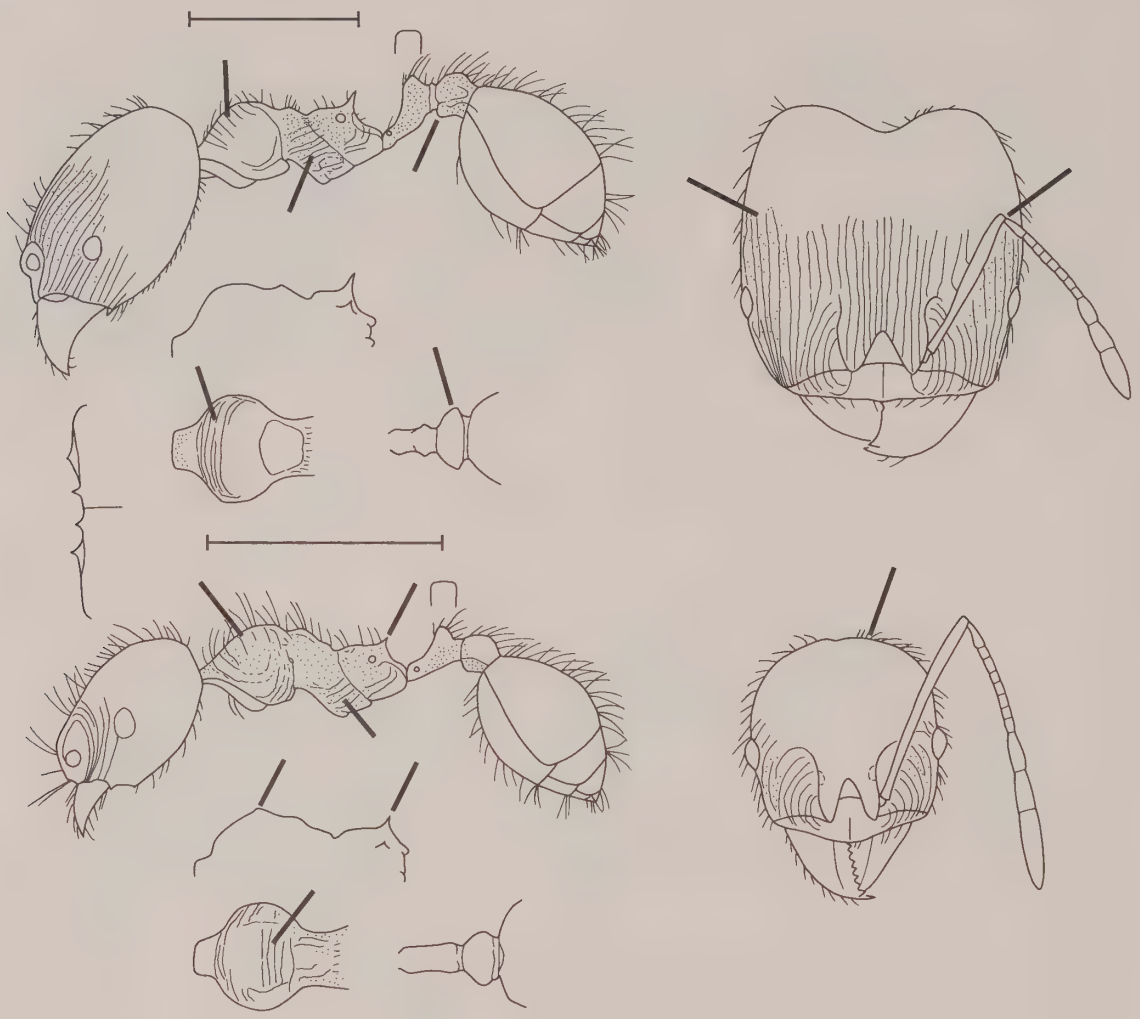


Pheidole fullerae **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after Kathryn Fuller, President of World Wildlife Fund-U. S. and champion of tropical biodiversity.
DIAGNOSIS Similar in various respects to the species listed in the heading above, differing as follows from these and other *tristis*-group species.
Major: antennal lobes project forward and downward as prominent lobes, in side view; shallow antennal scrobes present, each with a small patch of rugoreticulum behind it; almost all of the remaining surface of the head, up to and including the occiput, carinulate; humeri in dorsal-oblique view very prominent, lobose, and 2× higher than mesonotal convexity relative to the metanotal groove; corners of humeri rugoreticulate; postpetiole from above elliptical.
Minor: entire body almost completely smooth and shiny; propodeal spines reduced to denticles; promesonotal central half flat in side view; occiput narrow with a nuchal collar.
MEASUREMENTS (mm) Holotype major: HW 1.44, HL 1.44, SL 0.72, EL 0.16, PW 0.72.
Paratype minor: HW 0.54, HL 0.58, SL 0.64, EL 0.08, PW 0.34.
COLOR Major: mandibles dark reddish brown, body medium reddish brown, other appendages light reddish brown.
Minor: body medium reddish brown, appendages dark brownish yellow.
RANGE Known only from the type locality.
BIOLOGY The type colony was found nesting in a very small dead stick at the edge of a forest stream; the nest contained a seed cache.

Compare with species listed
in the Diagnosis below

FIGURE Upper: syntype, major. Lower: syntype, minor. COLOMBIA: Mt. San Lorenzo, Sierra Nevada de Santa Marta, 1700 m. Scale bars = 1 mm.

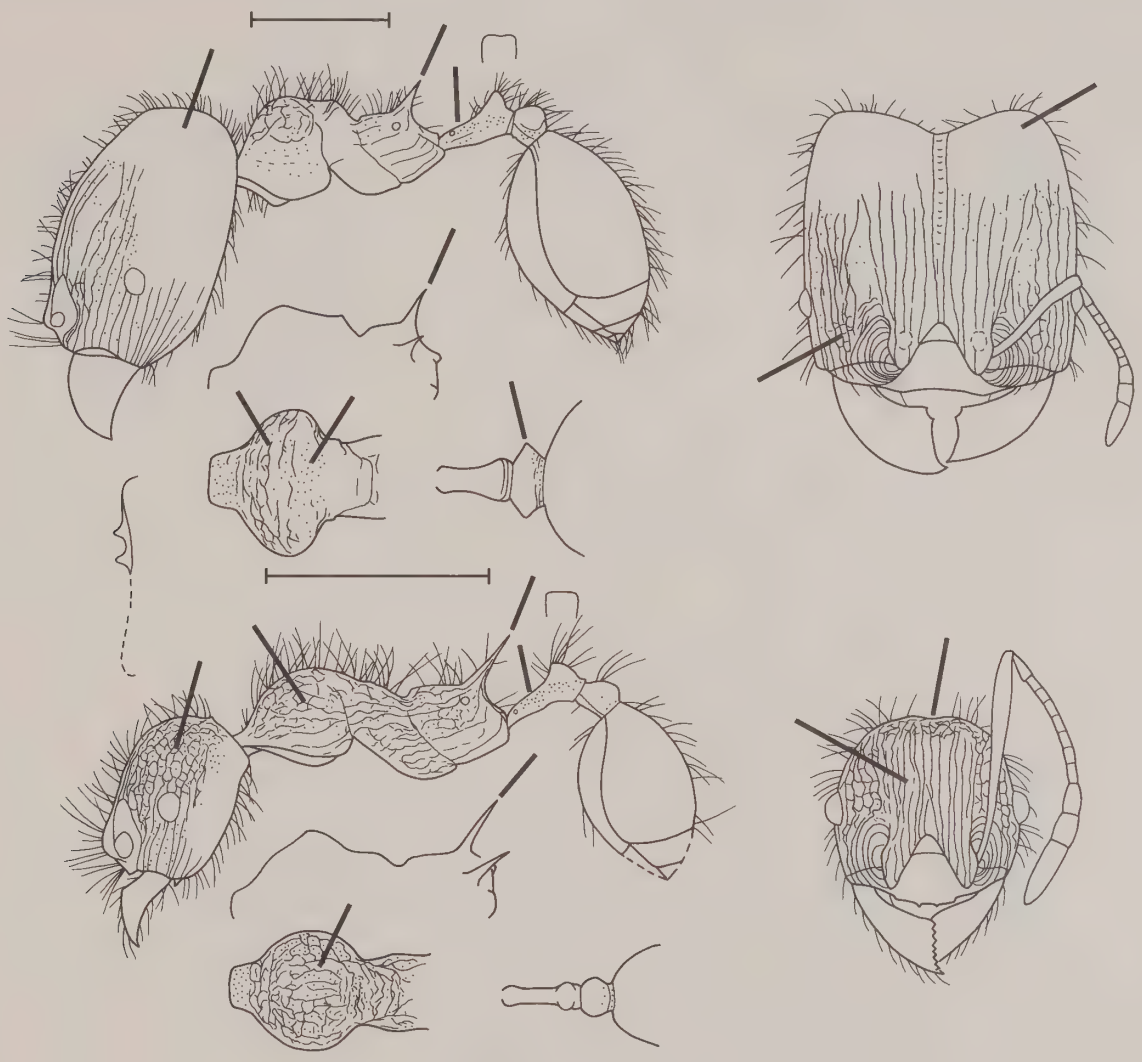


Pheidole gaigei Forel

Pheidole gaigei Forel 1914c: 616.

TYPES Mus. Hist. Nat. Genève; Mus. Comp. Zool. Harvard.
ETYMOLOGY Eponymous.
DIAGNOSIS A member of the *tristis* group, similar to *balzani, godmani, grandinodus, huilana, obrima,* and, less so, to species listed with them, distinguished as follows.
Major: postpetiole from above bell-shaped, 2× broader than petiole; postpetiole with prominent ventral, forward-projecting subangular process; anterior third of pronotal dorsum and all of mesopleuron carinulate; carinulae on dorsal surface of head reach midway between eye and occipital border.
Minor: occiput very broad, lacking nuchal collar; propodeal spines reduced to denticles; margins all around of pronotal dorsum, as well as lower half of mesopleuron, carinulate.
MEASUREMENTS (mm) Syntype major: HW 1.28, HL 1.38, SL 0.72, EL 0.08, PW 0.62.
Syntype minor: HW 0.64, HL 0.72, SL 0.66, EL 0.12, PW 0.44.
COLOR Major: concolorous light reddish yellow.
Minor: concolorous brownish yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: syntype, major of synonymous *gauthieri* var. *oxymora* (Panama). Lower: lectotype, minor (road from Dibulla to San Antonio, Guajira, Colombia). Scale bars = 1 mm.



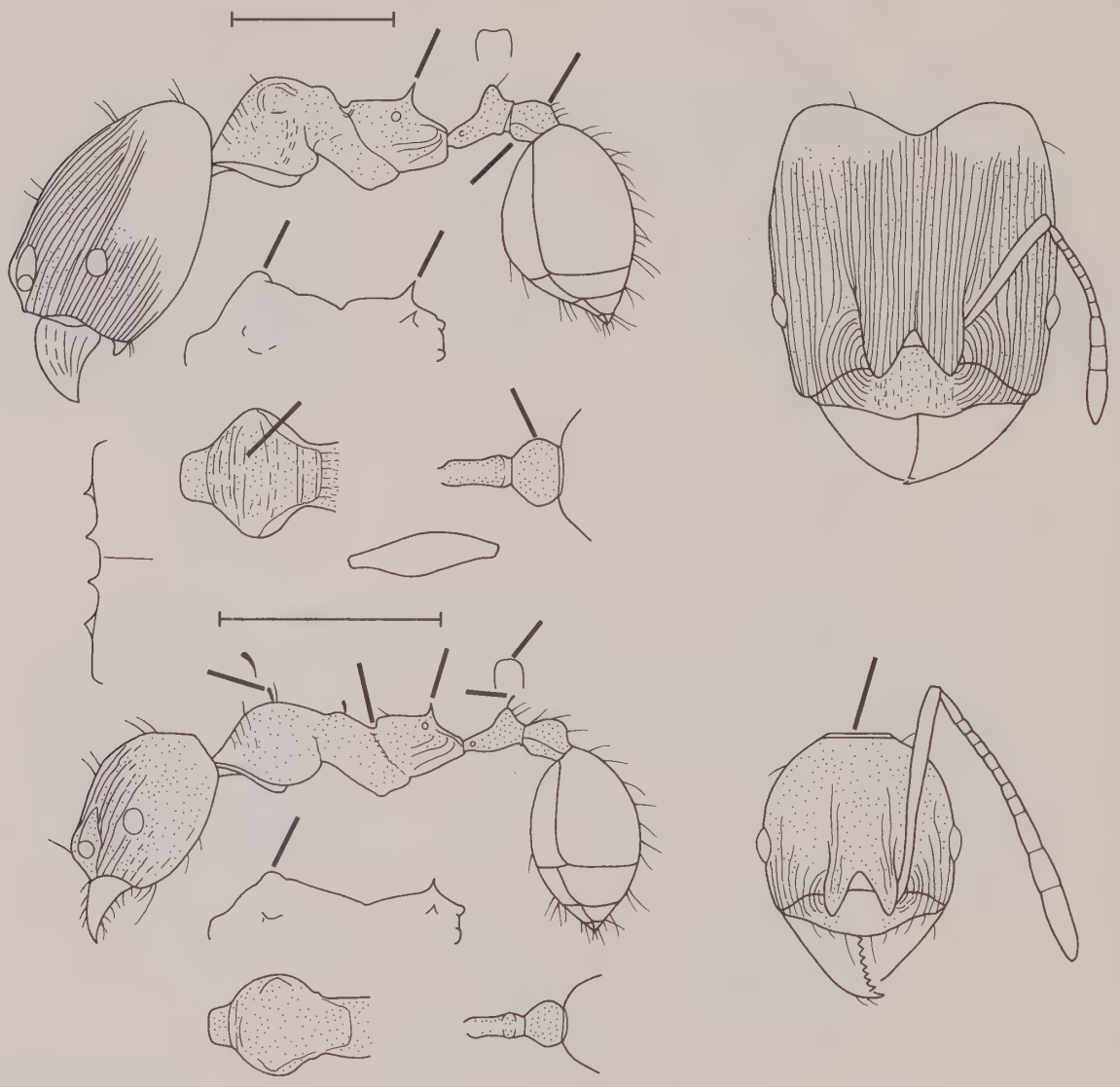
Pheidole gauthieri Forel

Pheidole ursus r. *gauthieri* Forel 1901j: 367. Raised to species level by Forel 1912g: 233. Syn.: *Pheidole gauthieri* var. *oxymora* Forel 1912g: 233, n.syn.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY Named after A. and C. Gauthier of Colombia, who assisted Forel in his itinerary.
DIAGNOSIS Similar to *antillana, coveri, fullerae, hetschkoi, heyeri, napoensis,* and *seguriger* in various traits but easily distinguished as follows.
Major: propodeal spines as long as basal face of propodeum; occiput smooth and shiny; smaller patch of rugoreticulum present laterad to each antennal fossa; loose rugoreticulum present on anterior half of pronotal dorsum but absent on posterior half; postpetiole spinose.
Minor: occiput, sides of head, and entire dorsum of mesosoma rugoreticulate, and almost all of remainder of head and mesosoma variously rugulose or carinulate; propodeal spines as long as basal face of propodeum; occiput narrowed but lacking a nuchal collar.
MEASUREMENTS (mm) Major (Panama): HW 2.04, HL 2.12, SL 0.86, EL 0.20, PW 0.94.
Lectotype minor: HW 0.80, HL 0.81, SL 0.86, EL 0.16, PW 0.54.
COLOR Major: concolorous light reddish brown.
Minor: head and mesosoma light reddish yellow; waist, gaster, and appendages clear dark yellow.
RANGE I have seen material from Guatemala (Tikal), Costa Rica (Osa Peninsula), Panama (localities in the Canal Zone), and Colombia. J. T. Longino (1997) reports it from both the Atlantic and Pacific lowlands of Costa Rica.
BIOLOGY In Costa Rica Longino (1997) found *gauthieri* in mature wet forest, nesting in dead wood in the low arboreal zone and foraging in the leaf litter and at extrafloral nectaries. A winged queen was present in a nest on Barro Colorado Island, Panama, 27 June (W. M. Wheeler).

Compare with species listed
in the Diagnosis below

FIGURE Upper: lectotype, major. The right hind femur is depicted next to the outline of the mesosoma.
Lower: paralectotype, minor. BRAZIL: Mato Grosso. Scale bars = 1 mm.

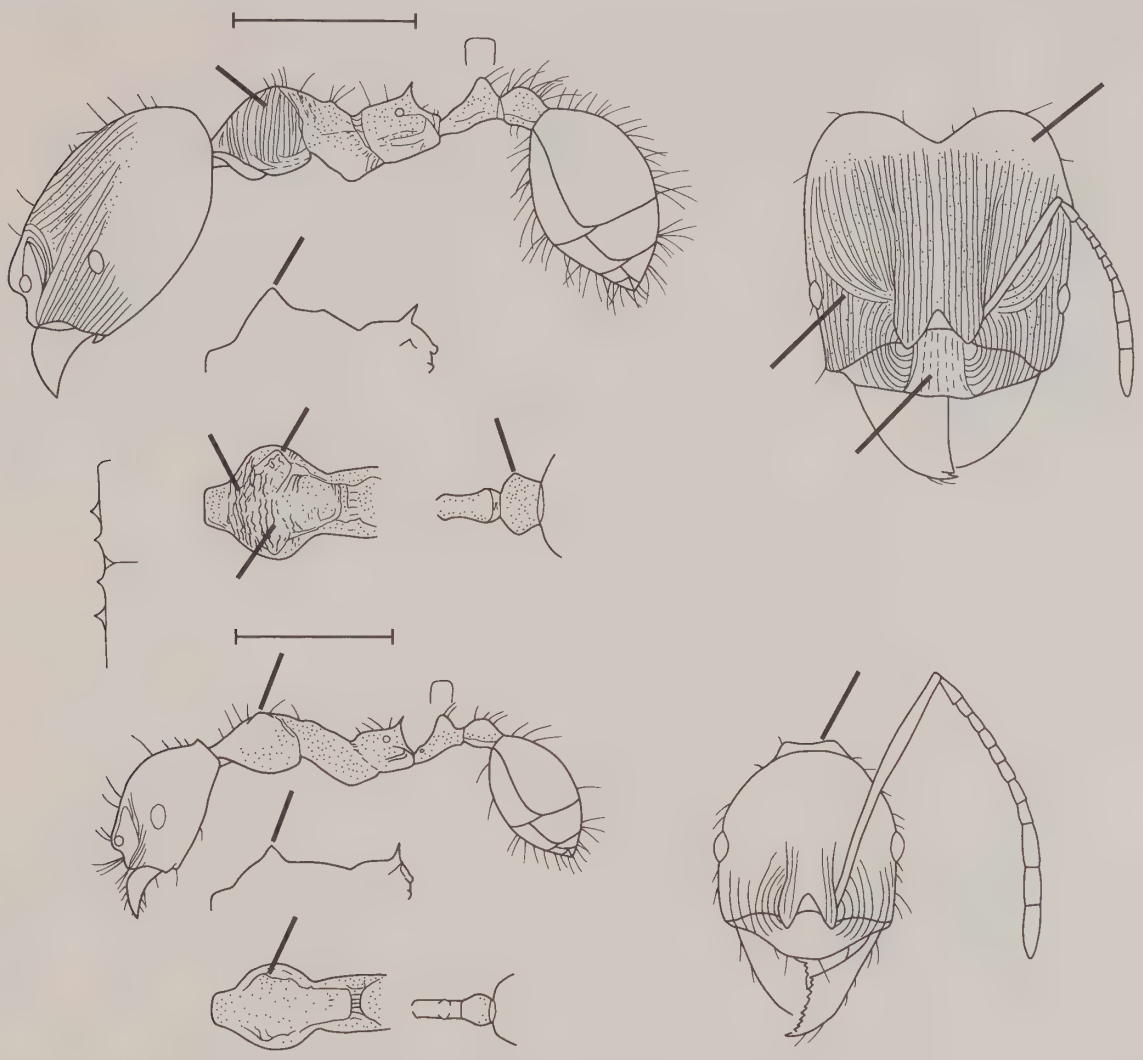


Pheidole germaini Emery, **new status**

Pheidole crassipes subsp. *germaini* Emery 1896g: 68.

TYPES Mus. Civ. Stor. Nat. Genova.
ETYMOLOGY Eponymous.
DIAGNOSIS A medium-sized reddish brown member of the *tristis* group whose **major** has a large, laterally subangulate postpetiolar node, moderately protuberant and rounded subpostpetiolar process, very prominent lobose humerus, swollen hind femora, and weak transverse carinulae covering the entire promesonotum.
Minor: dorsal pilosity consists of sparse, short hairs, some of which are clavate or spatulate; occiput narrow, with nuchal collar; propodeal spine erect.
Similar to *alpinensis, exarata, excubitor, grandinodus, grantae, obrima, rogeri, stulta, tristis,* and *zoster,* differing in many details of body form, sculpturing, and pilosity, as illustrated, and in color.
MEASUREMENTS (mm) Lectotype major: HW 1.56, HL 1.80, SL 0.86, EL 0.20, PW 0.80.
Paralectotype minor: HW 0.66, HL 0.72, SL 0.74, EL 0.12, PW 0.46.
COLOR Major: head and appendages rich medium reddish brown, rest of body dark reddish brown.
Minor: body very dark reddish brown, appendages a contrasting light reddish brown.
RANGE Known from the type series and a second collection at Cuiabá, Mato Grosso, by J. C. Trager.
BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Santa Catarina. Scale bars = 1 mm.

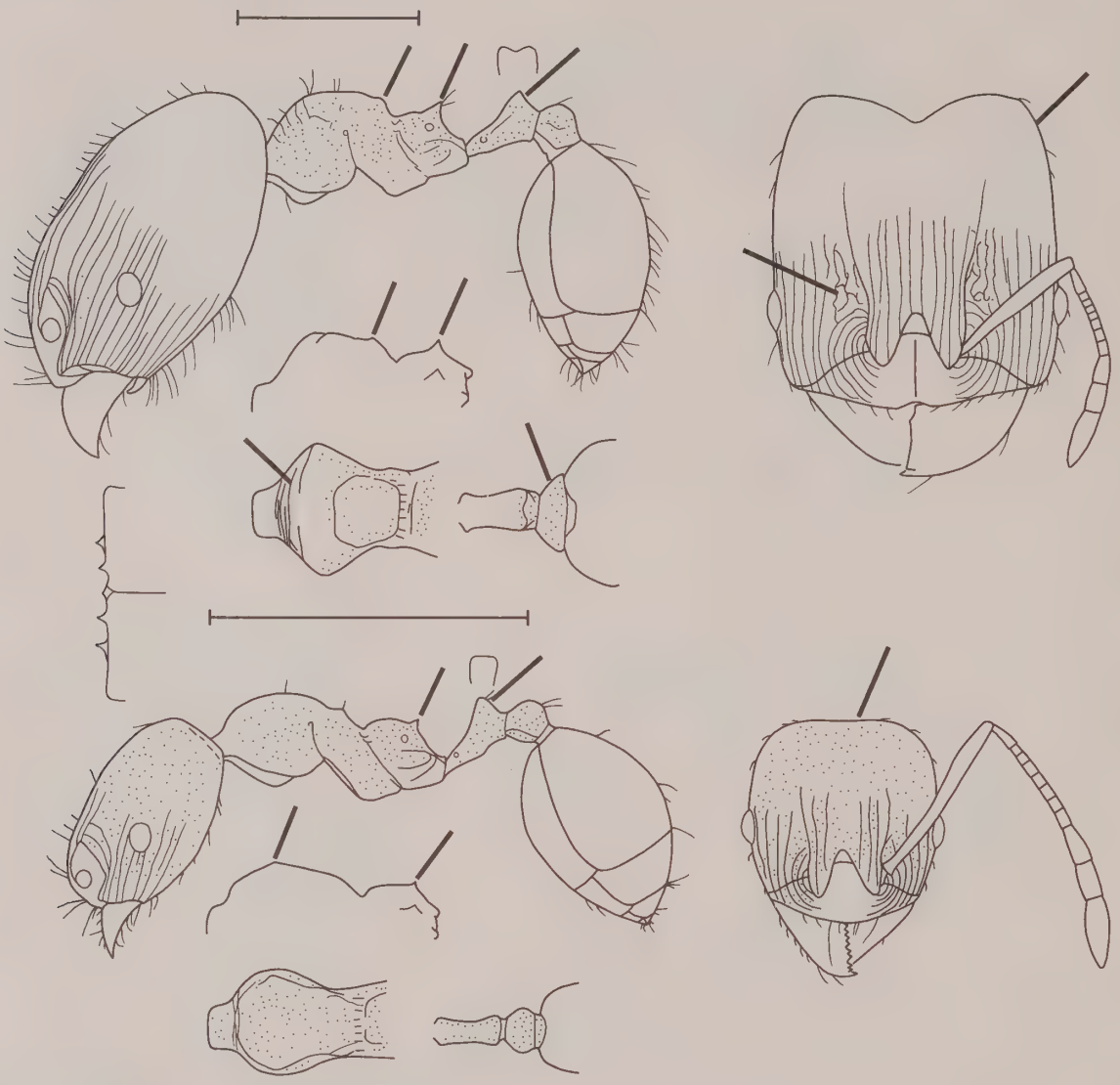


Pheidole gibba Mayr

Pheidole gibba Mayr 1887: 590. Syn.: *Pheidole gibba* var. *lopesi* Borgmeier 1937b: 233, synonymy by Kempf 1972d: 455.

TYPES Naturhist. Mus. Wien.
ETYMOLOGY L *gibba,* humpbacked, referring to the extended humeri.
DIAGNOSIS Very distinctive within *Pheidole* as a whole.
Major: large; slender; humeri very prominent, subangulate, each forming a large equilateral triangle in dorsal-oblique view; pronotum with transversely rugulose dorsum and vertically carinulate sides; all of dorsal surface of head carinulate except occiput and frontal triangle, which are smooth; carinulae that originate from posterior half of sides of frontal lobes curve laterally and then posteriorly; postpetiole diamond-shaped from above.
Minor: humeri as in major (q.v.); all of mesosomal dorsum foveolate; occiput narrowed, with nuchal collar.
MEASUREMENTS (mm) Lectotype major: HW 1.96, HL 2.10, SL 1.22, EL 0.24, PW 0.98.
Paralectotype minor: HW 0.84, HL 1.00, SL 1.12, EL 0.18, PW 0.58.
COLOR Major: concolorous medium reddish brown.
Minor: body light reddish brown, appendages brownish yellow.
RANGE Rio de Janeiro and Santa Catarina states, Brazil.
BIOLOGY Unknown.

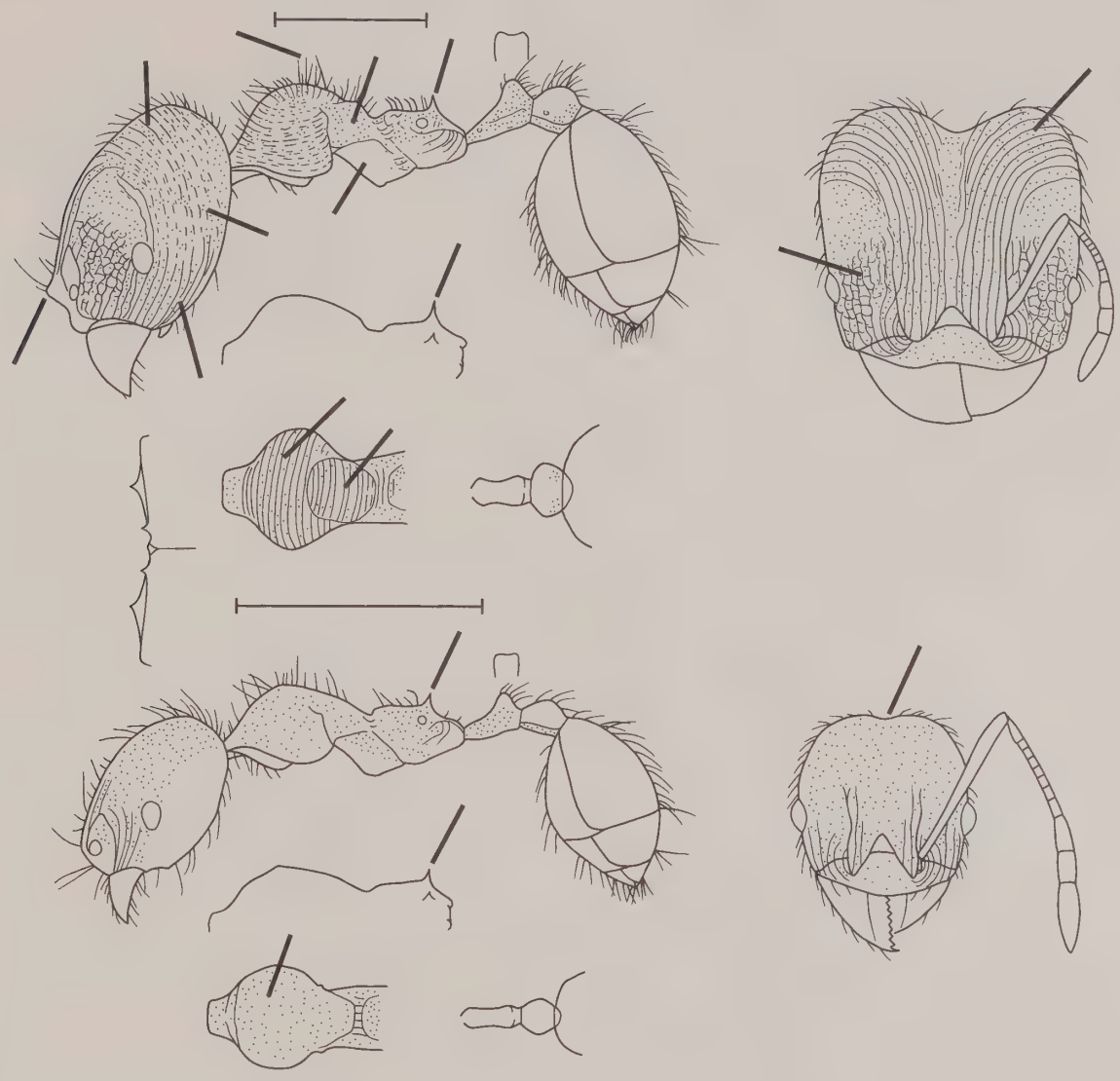
FIGURE Upper: holotype, major. Lower: paratype, minor. ARGENTINA: Santiago del Estero (James C. Trager). Scale bars = 1 mm.



Pheidole gigaflavens **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr L *gigaflavens,* giant *flavens,* alluding to closeness to *flavens* group and large size.
DIAGNOSIS An unusual species that mixes traits of the *tristis* and *flavens* groups, and is tentatively placed in the former.
Major: postpetiolar node from above very wide, bell-shaped; mesonotal convexity rudimentary; propodeal spine broad, and equilaterally triangular; petiolar node in side view tapered to a point; occiput narrower than anterior clypeal border; pilosity very sparse.
Minor: all of body except frontal triangle, mid-clypeus, and gaster foveolate and opaque; humerus subangulate in dorsal-oblique view; propodeal spines reduced to denticles; petiolar node in side view tapered to a blunt point; pilosity very sparse.
MEASUREMENTS (mm) Holotype major: HW 1.36, HL 1.46, SL 0.64, EL 0.20, PW 0.66.
Paratype minor: HW 0.54, HL 0.62, SL 0.58, EL 0.10, PW 0.34.
COLOR Major: body concolorous medium reddish brown, legs light reddish brown.
Minor: body medium yellowish brown (head darker than rest), legs light yellowish brown.
RANGE Known from the type locality and Club Las Palmas, Santa Cruz, Bolivia.
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: Monteverde, Puntarenas, 1500 m (Philip S. Ward). Scale bars = 1 mm.

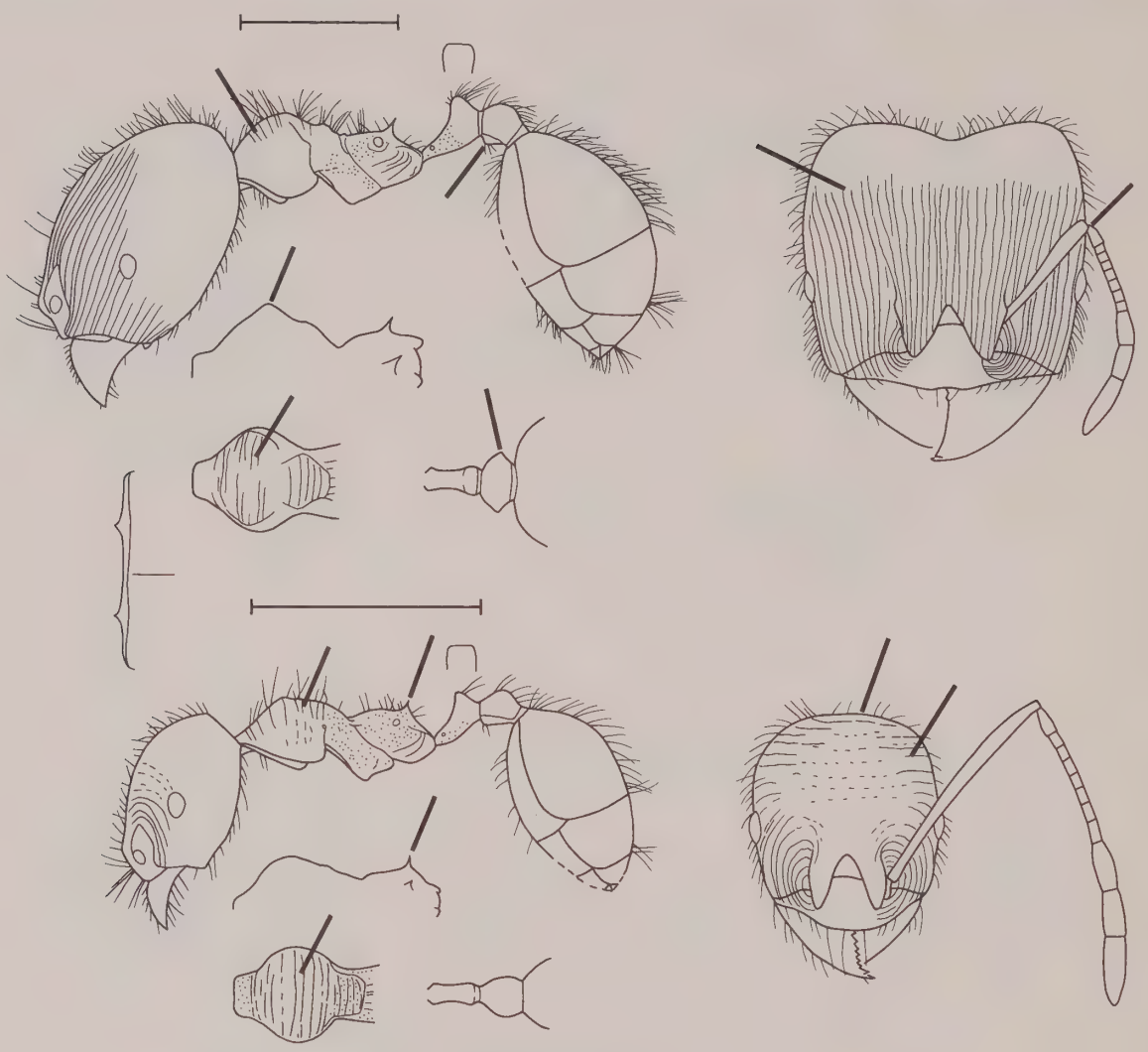


Pheidole glyphoderma **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *glyphoderma,* engraved skin, referring to the elaborate sculpturing of the major.
DIAGNOSIS A distinctive member of the *tristis* group, characterized by the following traits.
Major: in side view, frontal lobe projects forward to form a conspicuous triangle; parallel transverse carinulae encircle the posterior half of the dorsal surface of the head, curving downward along the genae to reach the anterior margin of the head capsule; each frontal lobe gives rise to parallel carinulae which curve outward on the posterior half of the head and reach the occipital lobes; pronotum and mesonotum (but not the mesopleuron or propodeum) covered by carinulae.
Minor: occiput broad, shallowly concave, and lacking nuchal collar; pronotum and mesothorax foveolate and opaque but lacking carinulae.
Close to *arietans,* also of Costa Rica, but differing in many features of body form and sculpturing, as illustrated.
MEASUREMENTS (mm) Holotype major: HW 1.64, HL 1.66, SL 0.82, EL 0.20, PW 0.84.
Paratype minor: HW 0.64, HL 0.74, SL 0.64, EL 0.14, PW 0.44.
COLOR Major: body dark reddish brown, appendages brownish yellow.
Minor: body plain light brown, appendages brownish yellow.
RANGE Known only from the type locality.
BIOLOGY Collected at a sugar bait in montane rainforest.

Compare with *balzani, gaigei, huilana*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. St. Vincent, West Indies (H. H. Smith). Scale bars = 1 mm.

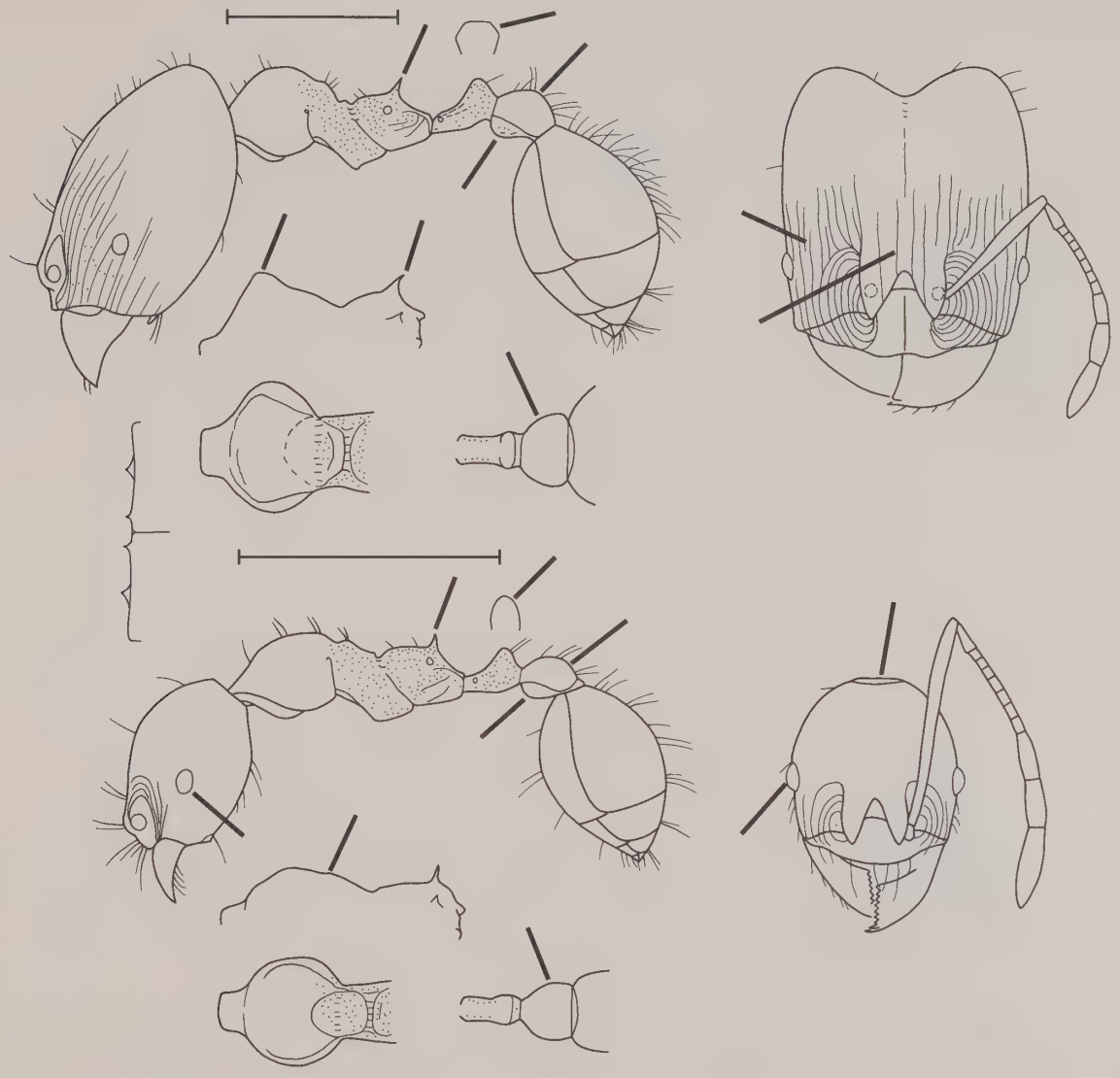


Pheidole godmani Forel

Pheidole godmani Forel 1893j: 404

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY Named after F. D. Godman, organizer of the British Association and Royal Society survey of the biota of the Antilles.
DIAGNOSIS A member of the *tristis* group, similar to the species listed in the heading above, and to lesser degree the species listed with them, distinguished as follows.
Major: reddish yellow; low, lobose subpostpetiolar process present; antennal scape short, its tip reaching the lateral border of the head in full-face view less than half the distance from eye to occipital corner; postpetiole from above cone-shaped; carinulae of head reaching two-thirds the distance from eye to occipital corner; humerus prominent, lobose, in dorsal-oblique view extending well above the low mesonotal convexity.
Minor: all of posterior dorsum of head and of entire dorsum of promesonotum transversely carinulate; semicircular carinulae fill the space between the antennal fossa and the eye.
MEASUREMENTS (mm) Lectotype major: HW 1.44, HL 1.52, SL 0.82, EL 0.14, PW 0.64.
Paralectotype minor: HW 0.62, HL 0.66, SL 0.72, EL 0.12, PW 0.42.
COLOR Major: head and body light reddish yellow, except for postpetiole and gaster, which are medium reddish yellow with a brownish tinge.
Minor: head and mesosoma medium yellowish brown; waist, gaster, and appendages a slightly contrasting light yellowish brown.
RANGE Known from St. Vincent. This species, with its nearest known relatives in South America, may be an endemic of the island. If so, it is a threatened species; H. H. Smith, whose collecting on St. Vincent in the 1890s was notably thorough, found it only three times.
BIOLOGY *P. godmani* was found near streams in mountain forest at 460 m. One colony was discovered nesting beneath dead leaves, a second in soil under a log.

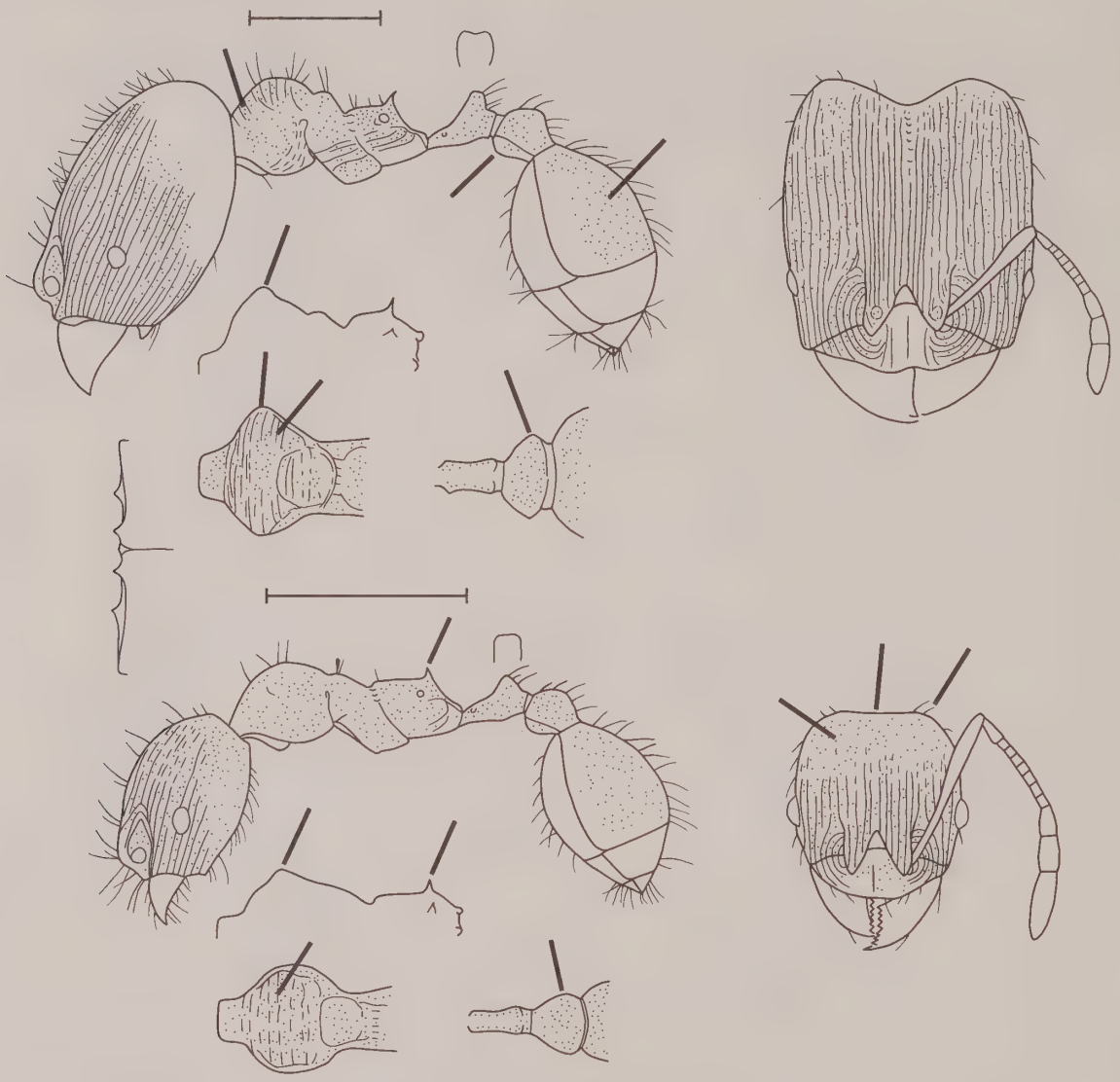
FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: 66 km north of Manaus on Caracara Road (William L. and Doris E. Brown). Scale bars = 1 mm.



Pheidole grandinodus **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *grandinodus,* large node, referring to the exceptionally large postpetiolar node.
DIAGNOSIS A large, yellow member of the *tristis* group with small eyes, exceptionally large, bell-shaped postpetiolar node, and large, bulging subpostpetiolar process. The propodeal spines are only medium-long, and in the **minor** fully erect. Seen from behind, the petiolar node of the **major** is hexagonal, with a flat top and that of the **minor** strongly convex.
Similar to *alpinensis, exarata, excubitor, gaigei, germaini, godmani, grantae, obrima, rogeri, severini, stulta, tristis,* and *zoster,* differing in many details of body form, sculpturing, and pilosity, as illustrated, and in color.
MEASUREMENTS (mm) Holotype major: HW 1.53, HL 1.54, SL 0.82, EL 0.14, PW 0.66.
Paratype minor: HW 0.54, HL 0.66, SL 0.74, EL 0.06, PW 0.40.
COLOR Major: head, mesosoma, and appendages reddish yellow; waist and gaster brownish yellow.
Minor: body dark yellow, appendages light.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: major. Lower: minor. COLOMBIA: Reserva Natura El Guayaba, Cali-Popayán, Cauca, 1600 m (Richard Root and W. L. Brown). Compared with syntypes in Museum Histoire Naturelle, Genève. (Type locality: Costa del Tablazo, Costa Rica, collected by Paul Biolley). Scale bars = 1 mm.

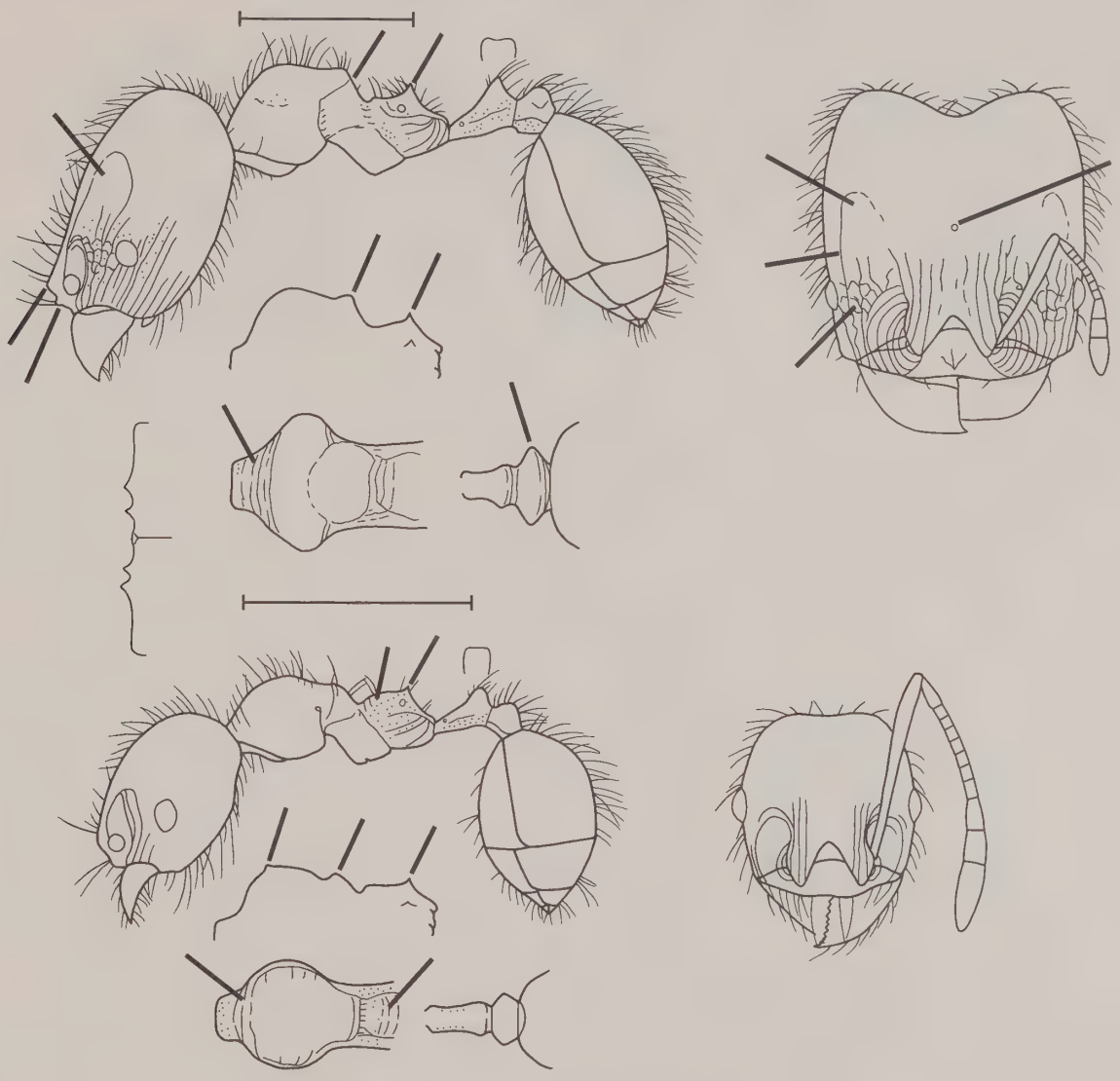


Pheidole grantae Forel, **new status**

Pheidole crassipes r. *grantae* Forel 1908c: 53.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY Eponymous, but no person specified.
DIAGNOSIS A large, blackish brown member of the *tristis* group with exceptionally large, bell-shaped postpetiolar node, prominent convex subpostpetiolar convexity, prominent subangular pronotal humeri, and fully shagreened and opaque first gastral tergite.
Major: sculpturing of dorsal surface of the head reaches posteriorly to just short of the occiput.
Similar to *alpinensis, exarata, excubitor, germaini, grandinodus, obrima, rogeri, stulta, tristis,* and *zoster,* differing in many details of body form, sculpturing, and pilosity, as illustrated, and in color.
MEASUREMENTS (mm) Syntype major: HW 1.60, HL 1.60, SL 0.86, EL 0.20, PW 0.80.
Syntype minor: HW 0.76, HL 0.86, SL 0.80, EL 0.12, PW 0.48.
COLOR Major: blackish brown, mesosoma and appendages with reddish undertones.
Minor: blackish brown, appendages light to medium brown.
RANGE Known only from the type locality in Costa Rica and the Colombian locality cited in the figure caption.
BIOLOGY The Reserva Natura El Guayaba series was collected in montane rainforest.

FIGURE Upper: holotype, major. Lower: paratype, minor. VENEZUELA: San Cristobal-La Florida Road, LaBlanca to Mundo Nuevo, Táchira, 1100 m (J. Lattke and W. L. Brown). Scale bars = 1 mm.

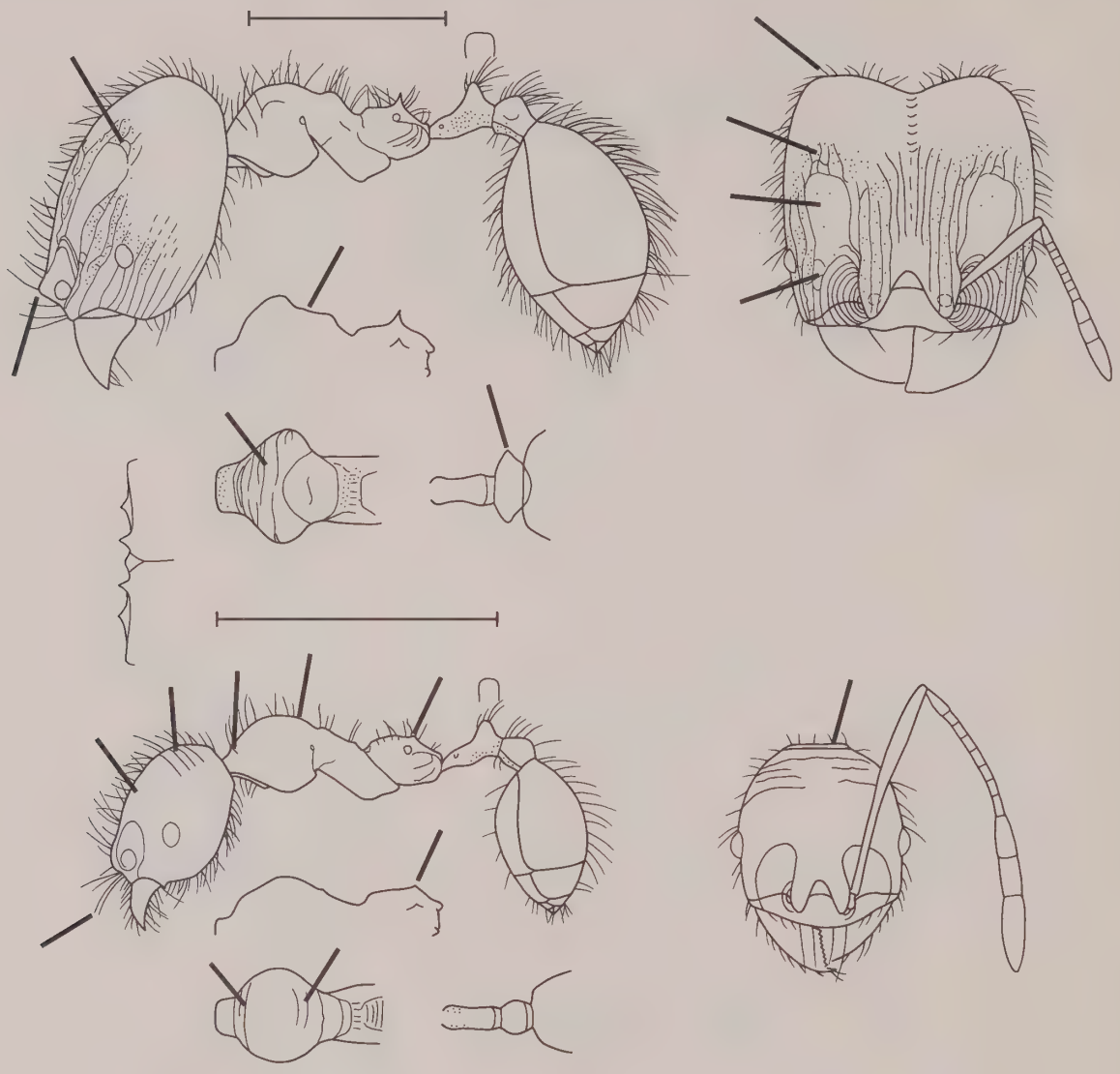


Pheidole gravida **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *gravida,* laden, referring to the heavy-looking promesothorax.
DIAGNOSIS Similar in various respects to the species listed in the heading above.
Major: yellow; center of midclypeus raised to a small point; frontal lobes extended slightly, and subangulate in side view; median ocellus or a small pit in ocellar location present, as shown; promesonotum massive, descending through a long, steep face to the metanotum; very faint antennal scrobe present; propodeal spines equilaterally triangular; postpetiolar node from above elliptical, 2× as broad as petiolar node.
Minor: humerus denticulate and mesonotal convexity subangulate in dorsal-oblique view; propodeal spines reduced to denticles; anterior pronotal fringe and propodeal dorsum carinulate.
MEASUREMENTS (mm) Holotype major: HW 1.46, HL 1.60, SL 0.62, EL 0.18, PW 0.86.
Paratype minor: HW 0.66, HL 0.70, SL 0.64, EL 0.14, PW 0.44.
COLOR Major: reddish medium yellow.
Minor: plain medium yellow.
RANGE Known only from type locality.
BIOLOGY Unknown.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. ECUADOR: 3 km southwest of Bucay, Guayas (William L. Brown). Scale bars = 1 mm.



Pheidole guayasana **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named based on the Ecuadoran province of the type locality.

DIAGNOSIS Similar in various characters to *fullerae, gauthieri, hetschkoi, heyeri, napoensis, pidax, rosae, rosula,* and especially *securiger,* differing as follows.

Major: brown; frontal lobes extended forward as conspicuous right-angular processes, seen from the side; antennal scrobes present, each followed posteriorly by a patch of rugoreticulum; a very small patch of rugoreticulum present on edge of antennal fossa; occipital lobes in full-face view smoothly rounded; posterior half of pronotal profile flat in dorsal-oblique view; mesonotum and dorsal propodeal face almost entirely free of carinulae; postpetiole spinose.

Minor: propodeal spines reduced to denticles; occiput narrow, with very thin nuchal collar; carinulae on promesonotum mostly limited to anterior and posterior margins; carinulae on head mostly limited to posterior fourth of dorsal head surface.

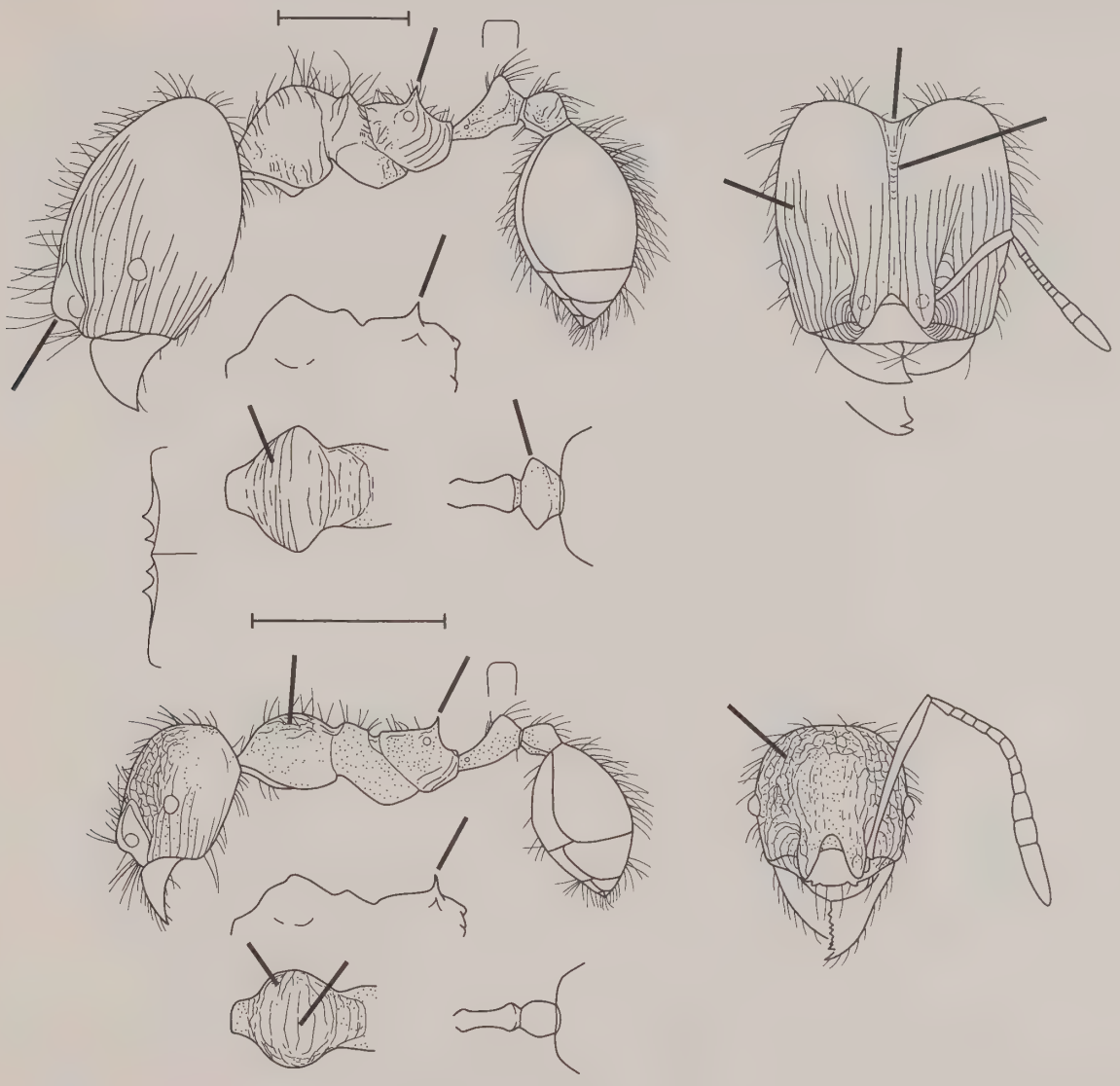
MEASUREMENTS (mm) Holotype major: HW 1.52, HL 1.64, SL 0.68, EL 0.14, PW 0.74.
Paratype minor: HW 0.56, HL 0.60, SL 0.70, EL 0.08, PW 0.38.

COLOR Major: gaster plain dark brown; rest of body, and mandibles, medium reddish brown; other appendages plain dark yellow.
Minor: body plain light brown, appendages dark yellow.

RANGE Known only from Bucay and Rio Palenque, Ecuador.

BIOLOGY The type series was collected from a forest at the base of a mountain, and the nest contained seeds. Winged queens were present in the Rio Palenque nest when found by G. J. Umphrey on 28 July.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Blumenau, Santa Catarina (William Müller). Scale bars = 1 mm.



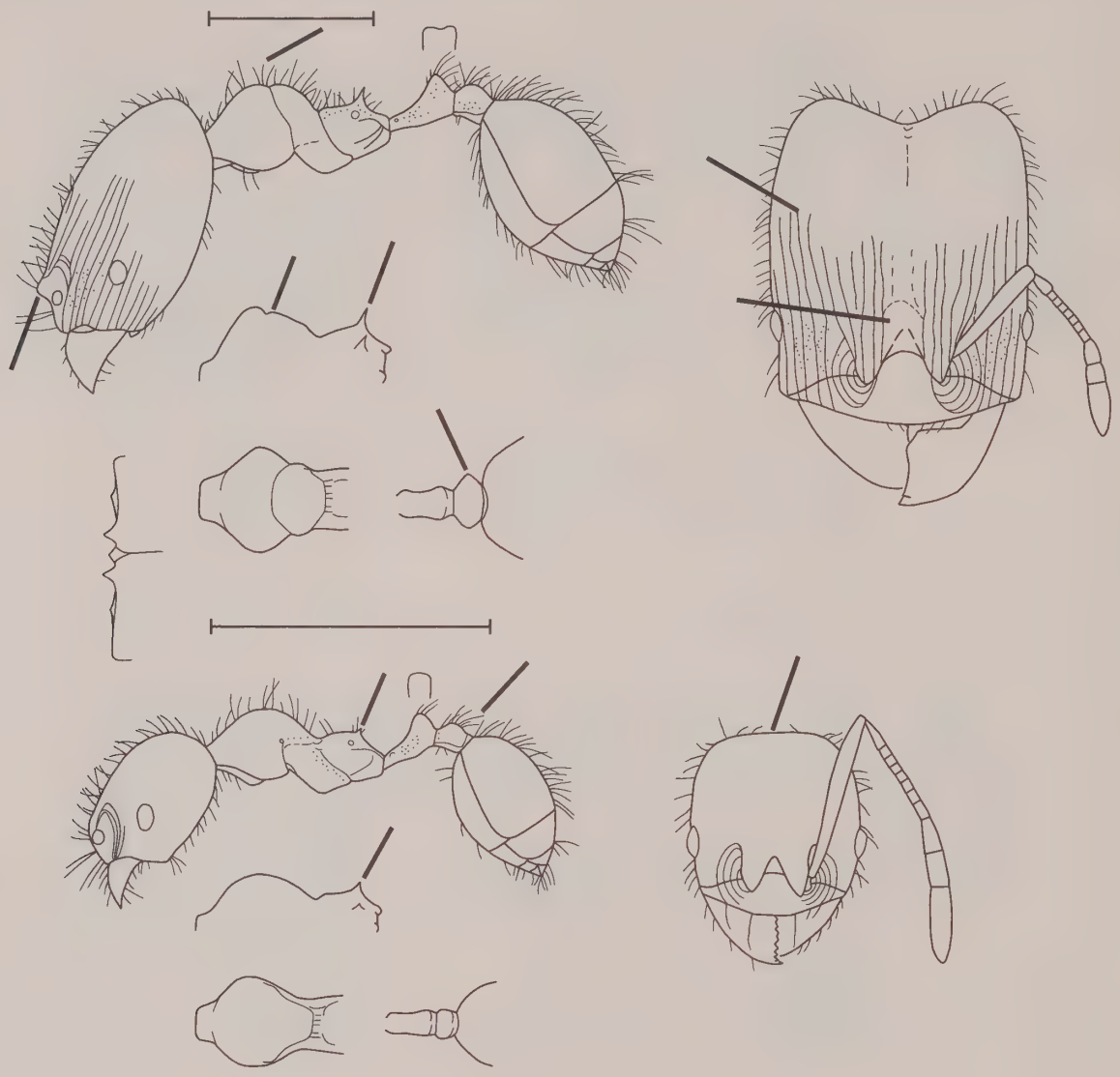
Pheidole guilelmimuelleri Forel

Pheidole guilelmimuelleri Forel 1886a: 210. Syn.: *Pheidole guilelmimuelleri* var. *gustavi* Forel 1911e: 302, n.syn. Raised to species level in this monograph: *fera*.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY Named after the collector, William (Guilelmi) Müller.
DIAGNOSIS A large reddish brown species, similar to *antillana* of the Lesser Antilles and *avia, bucculenta, hetschkoi, heyeri, hortonae, mamore, praeses, rhytifera,* and *sarcina* of South America.
Major: propodeal spines long, stout, and nearly erect; postpetiole cornulate; sculpturing of dorsal surface of head consists entirely of longitudinal carinulae, which are confined to the anterior two-thirds of the head capsule except for two carinulae that proceed to the occiput along the midline; promesonotal dorsum almost completely covered by transverse carinulae. The major is very similar to that of *bucculenta,* but the minor is easily distinguished, as illustrated.
Minor: occiput, sides of head mesad to the eyes, and lateral margins of the pronotal dorsum rugoreticulate; remainder of dorsal surface of head weakly carinulate; propodeal spines long, thin, and erect.
MEASUREMENTS (mm) Lectotype major: HW 2.10, HL 2.12, SL 0.98, EL 0.20, PW 1.02.
Paralectotype minor: HW 0.82, HL 0.84, SL 0.94, EL 0.14, PW 0.54.
COLOR Major: concolorous light reddish brown.
Minor: body yellowish brown, appendages medium to dark yellow.
RANGE Santa Catarina, Brazil. Also recorded from Misiones, Argentina, by Kempf (1972b).
BIOLOGY Unknown.

Compare with *subarmata,* also
allarmata, cramptoni, synarmata, triplex

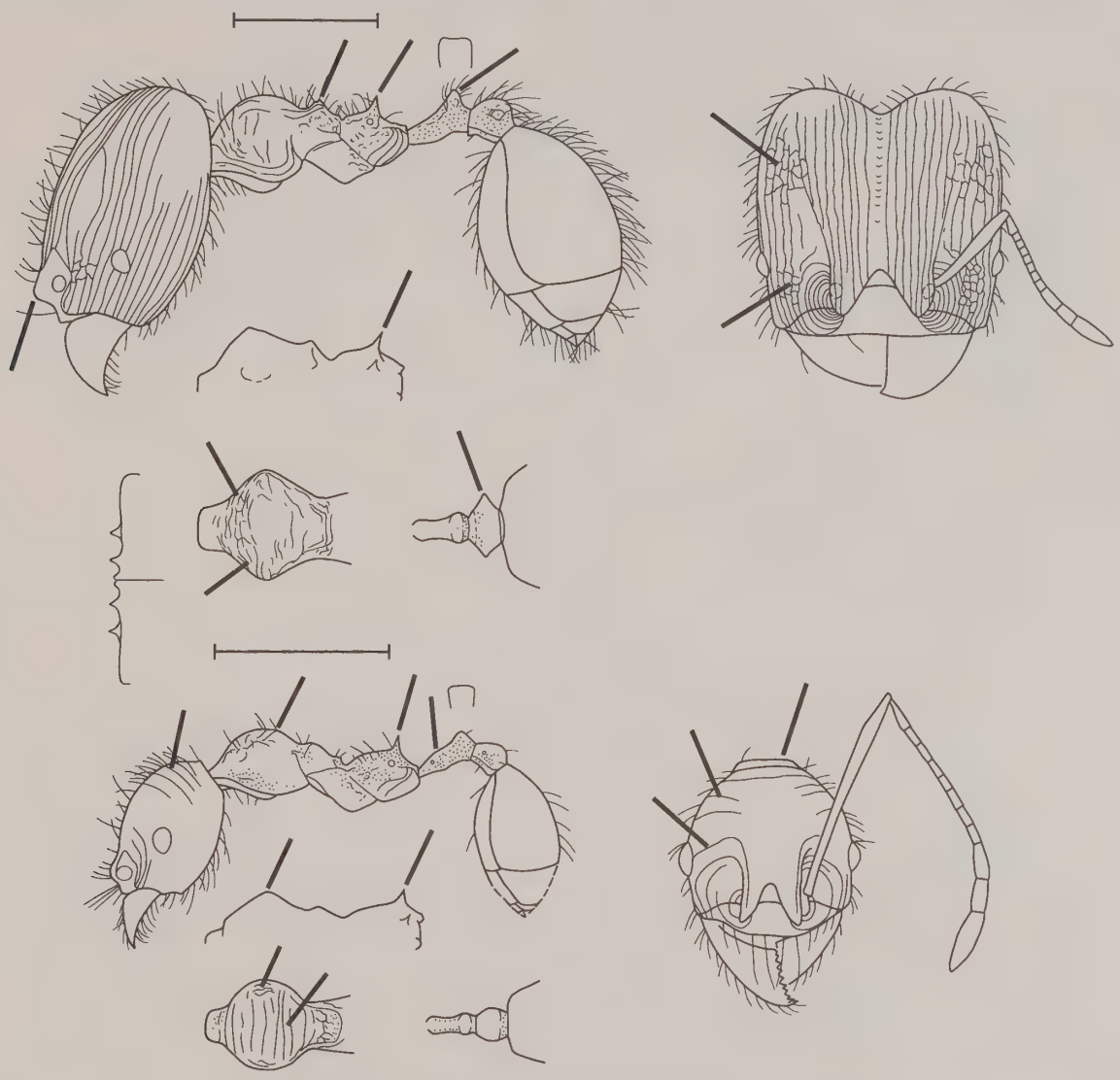
FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: San José de la Montaña, 10 km north of Heredia (Yvette Perfecto). Scale bars = 1 mm.



Pheidole hasticeps **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *hasticeps,* spear-headed, referring to the major.
DIAGNOSIS Closely similar to *subarmata,* but differing by the following traits.
Major: larger and more darkly colored; pronotum bilobous; propodeal spines longer and thinner, postpetiolar nodal margins more sharply angulate; carinulae mesad to the eyes extend halfway to the occipital border.
Minor: larger and darker, otherwise nearly identical to *subarmata.*
See also the less similar *allarmata, cramptoni, synarmata,* and *triplex.*
MEASUREMENTS (mm) Holotype major: HW 1.20, HL 1.40, SL 0.60, EL 0.16, PW 0.64.
Paratype minor: HW 0.52, HL 0.54, SL 0.54, EL 0.10, PW 0.34.
COLOR Major: head and body dark brown, appendages light to medium brown.
Minor: head and body medium brown, appendages light brown.
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Santa Catarina. Scale bars = 1 mm.



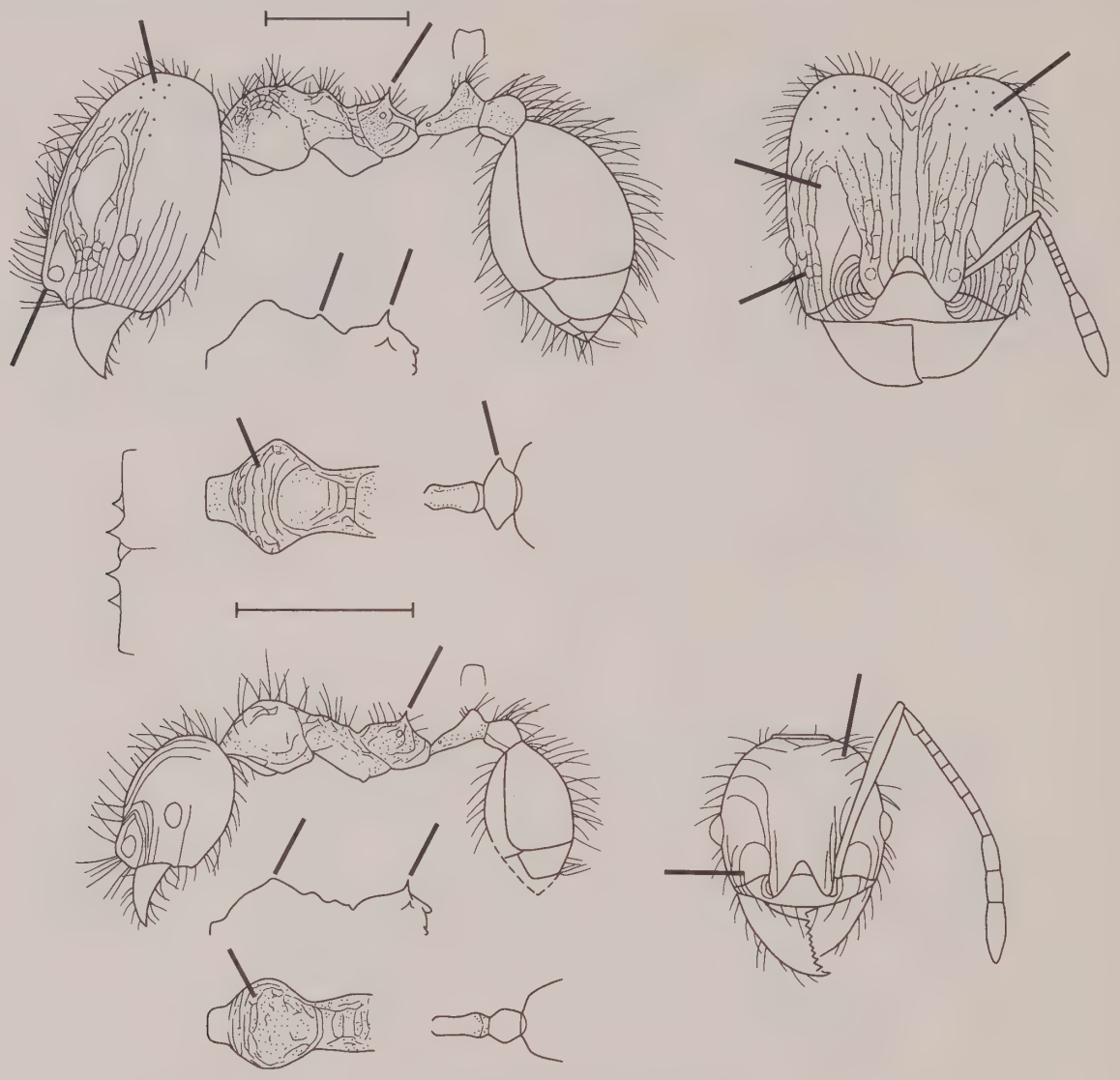
Pheidole hetschkoi Emery

Pheidole hetschkoi Emery 1896g: 66. Syn.: *Pheidole hetschkoi* var. *frivola* Santschi 1923d: 57, n.syn. Raised to species level in this monograph: *senillis*.

TYPES Mus. Civ. Stor. Nat. Genoa.
ETYMOLOGY Eponymous.
DIAGNOSIS Similar to species listed in heading above, differing in the following combination of traits.
Major: shallow antennal scrobes with surfaces weakly sculptured and shiny; patches of rugoreticulum mesad to the eyes and others posterior to the antennal scrobes; middle third of the dorsal head surface covered by longitudinal carinulae that reach the occipital border; anterior margin of the pronotal dorsum rugoreticulate, and lateral borders irregularly carinulate; postpetiolar cornicles strongly developed.
Minor: transverse carinulae cover the occiput; carinulae arising on the frontal lobes curve to the outside (laterad) to approach the eyes transversely; pronotal dorsum entirely carinulate; mesonotal dorsum rugoreticulate; mesonotum rugoreticulate; occiput narrow, with nuchal collar.
MEASUREMENTS (mm) Lectotype major: HW 2.00, HL 2.14, SL 0.90, EL 0.24, PW 0.84.
Paralectotype minor: HW 0.76, HL 0.86, SL 0.90, EL 0.16, PW 0.54.
COLOR Major: head, mesothorax, and appendages medium reddish brown, waist and gaster medium plain or reddish brown.
Minor: head and mesosoma medium brown; waist, gaster, and appendages brownish yellow.
RANGE In addition to the types, from the state of Santa Catarina, I have examined series from Espirito Santo and São Paulo, variously at 750–800 m.
BIOLOGY Occurs in montane rainforest. A seed cache was found in a nest in the Boraceia Biological Station, Salesópolis, São Paulo (W. L. Brown).

Compare especially with *antillana,* also with
fullerae, gauthieri, hetschkoi, napoensis, securiger

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: São Leopoldo, Rio Grande do Sul. Scale bars = 1 mm.

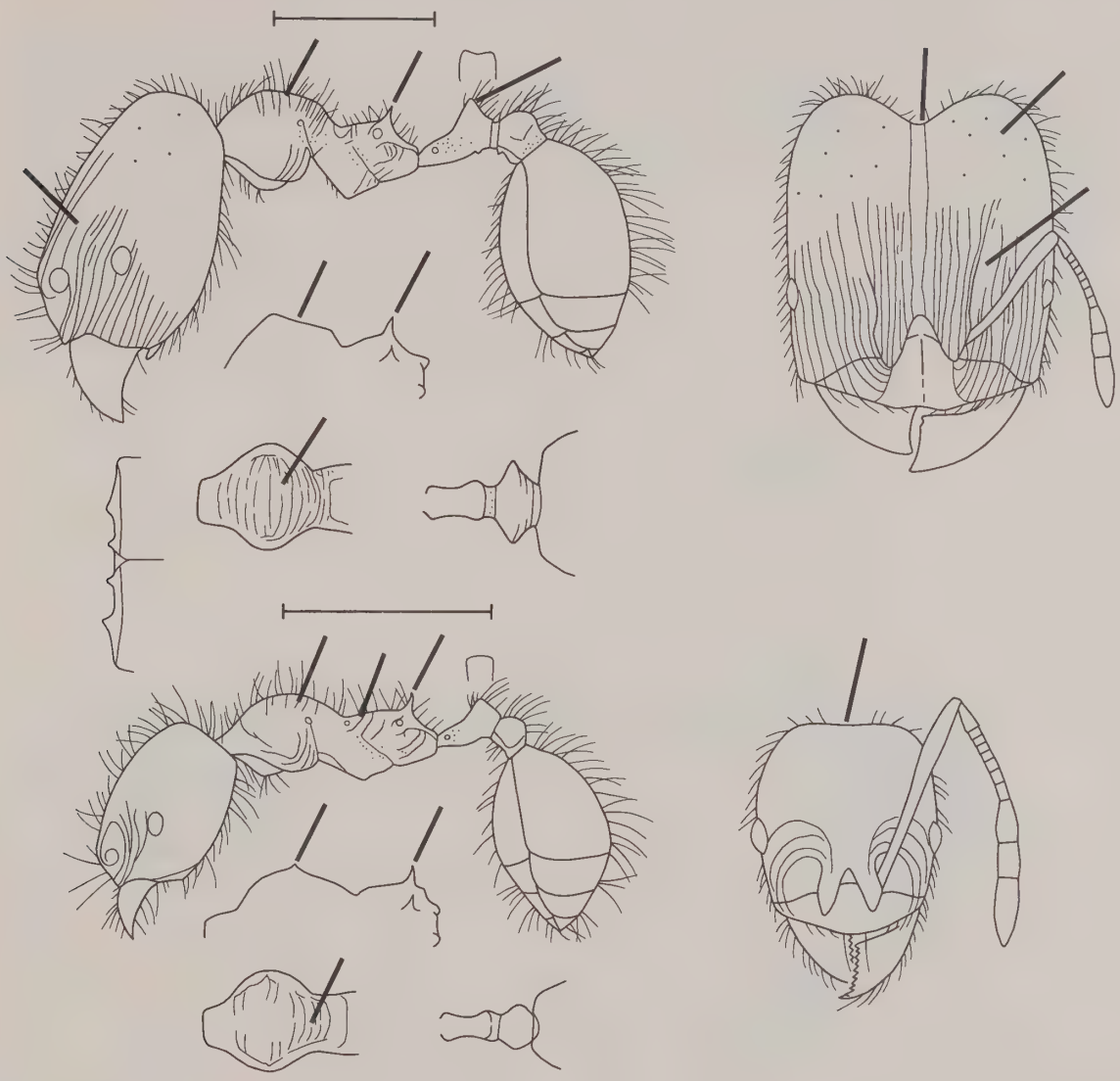


Pheidole heyeri Forel, **new status**

Pheidole guilelmimuelleri var. *heyeri* Forel 1911e: 302. Syn.: *Pheidole guilelmimuelleri* var. *ultrix* Forel 1912g: 221, n. syn. Types not seen: *Pheidole guilelmimuelleri heyeri* var. *dryas* Santschi 1929d: 288 (Rio de Janeiro), *Pheidole guilelmimuelleri heyeri* var. *infans* Santschi 1923d: 56 (Santa Catarina, Brazil), and *Pheidole guilelmimuelleri heyeri* var. *injuncta* Forel 1911e: 302 (São Paulo), which are all unavailable names.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY Eponymous.
DIAGNOSIS Similar especially to *antillana* of the Lesser Antilles, but differing in the following combination of traits.
Major: shallow scrobes, whose surfaces lack sculpturing; small rugoreticula present mesad to the eyes and on the dorsal pronotal margins; dorsal surface of occiput mostly smooth but with scattered foveae; mesonotal convexity subangulate; postpetiole strongly cornulate.
Minor: occiput and lateral posterior quarters of cephalic dorsum transversely carinulate; humerus subangulate in dorsal-oblique view; most of promesonotum rugulose, with margins loosely rugoreticulate. Color of major and minor: reddish yellow.
MEASUREMENTS (mm) Lectotype major: HW 2.02, HL 2.16, SL 0.90, EL 0.22, PW 0.82.
Paralectotype minor: HW 0.82, HL 0.86, SL 0.92, EL 0.14, PW 0.54.
COLOR Major: body medium reddish yellow, appendages light reddish yellow.
Minor: body dark reddish yellow, appendages light reddish yellow.
RANGE São Paulo and Rio Grande do Sul states, Brazil.
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. DOMINICAN REPUBLIC: 14 km northwest of Bonao, 19°02′N 70°30′W, 1100 m (Philip S. Ward). Scale bars = 1 mm.



Pheidole hispaniolae **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the Greater Antillean island of origin.

DIAGNOSIS Similar in various traits to *balzani, brunnescens, exarata, excubitor, fabricator, germaini, nigella, prattorum, sabina, sarpedon, tristis, tristops,* and *unicornis,* differing as follows.

Major: head subquadrate, with gently convex sides and deep occipital cleft; promesonotal profile flat; propodeal spines thin, almost needle-like; petiolar node in side view tapered to a blunt point; postpetiolar node 2× broader than petiolar node in dorsal view, and cone-shaped; posterior third of dorsal head surface smooth and mostly shiny, sprinkled with widely spaced foveae; no rugoreticulum present anywhere; promesonotum carinulate.

Minor: occiput broad, lacking nuchal collar; humeri dentate; promesonotal profile smoothly semicircular; promesonotum partially carinulate; most of body smooth and shiny.

MEASUREMENTS (mm) Holotype major: HW 1.64, HL 1.86, SL 0.86, EL 0.20, PW 0.78.
Paratype minor: HW 0.66, HL 0.74, SL 0.78, EL 0.14, PW 0.46.

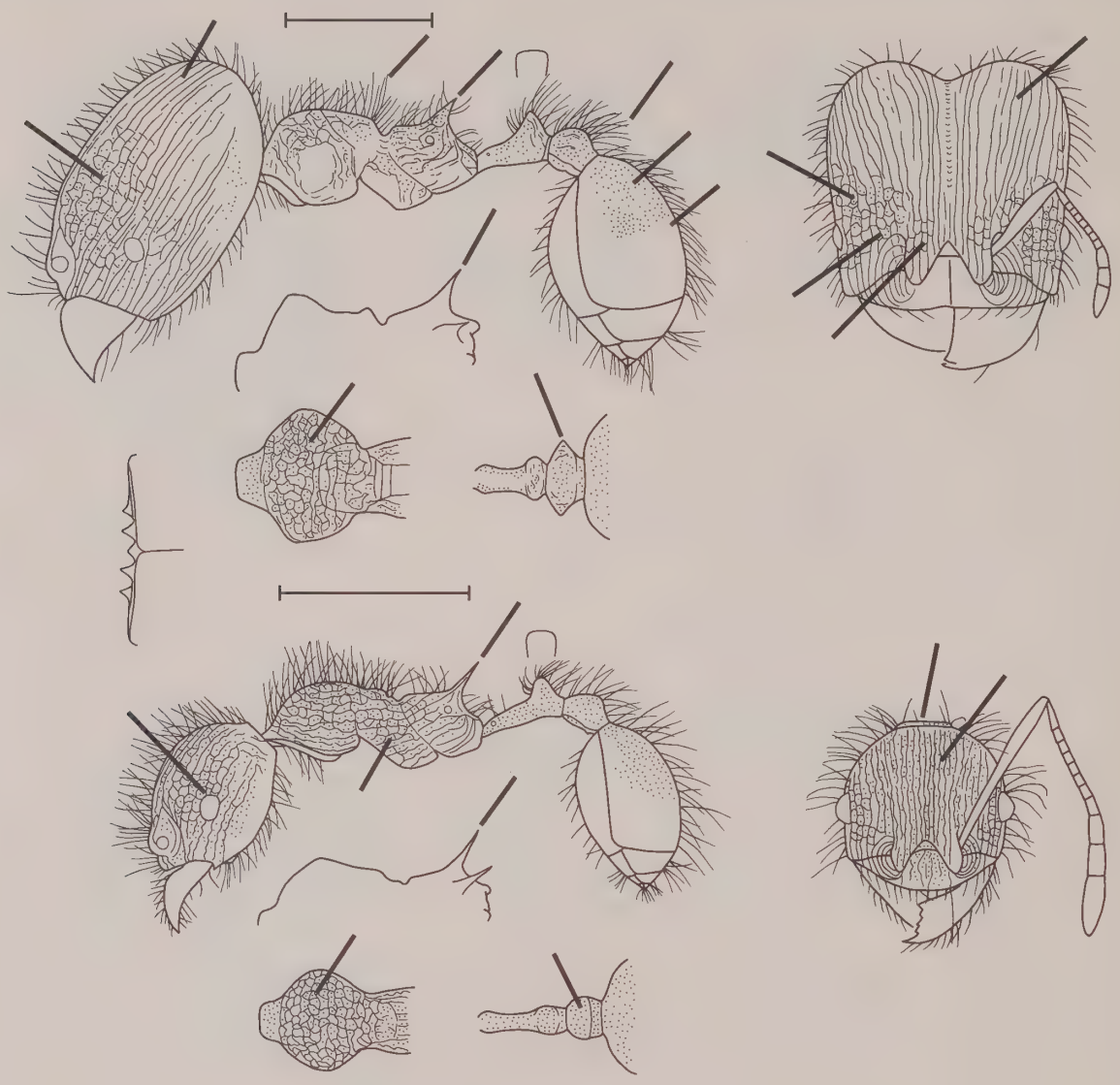
COLOR Major: body light reddish brown, mandibles medium reddish brown, legs plain medium yellow.
Minor: light to medium brownish yellow, legs plain medium yellow.

RANGE Known from the type locality and other sites at 1100–1500 m in the Dominican Republic.

BIOLOGY The type colony was found in a rotting log in second-growth mountain rainforest. Other colonies were found in pine and mixed pine-hardwood forests. One nest contained males when discovered in April.

Compare with *minax, terribilis, ursus*, and species around *macromischoides*

FIGURE Upper: holotype, major. Lower: paratype, minor. ECUADOR: Jatun Sacha Biological Station, Misahuali (Peter Frumhoff). Scale bars = 1 mm.



Pheidole horribilis **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *horribilis,* dreadful, bristly, rough.

DIAGNOSIS Similar to species listed in heading above, differing as follows.

Major: propodeal spines stout, over half as long as basal propodeal face anterior to them; posterior half of dorsal head surface carinulate and anterior half, including frontal lobes, mostly rugoreticulate; entire promesonotum rugoreticulate; anterior half of central strip of first gastral tergite shagreened; pilosity dense, erect to suberect, and long, most hairs as long as Eye Length or longer.

Minor: propodeal spine as long as propodeal basal face; promesonotum and mesopleuron almost entirely rugoreticulate; occiput narrow, with nuchal crest, rugulose and not rugoreticulate; anterior half of central strip shagreened.

MEASUREMENTS (mm) Holotype major: HW 1.88, HL 1.90, SL 0.84, EL 0.20, PW 0.94.
Paratype minor: HW 0.80, HL 0.80, SL 0.86, EL 0.14, PW 0.56.

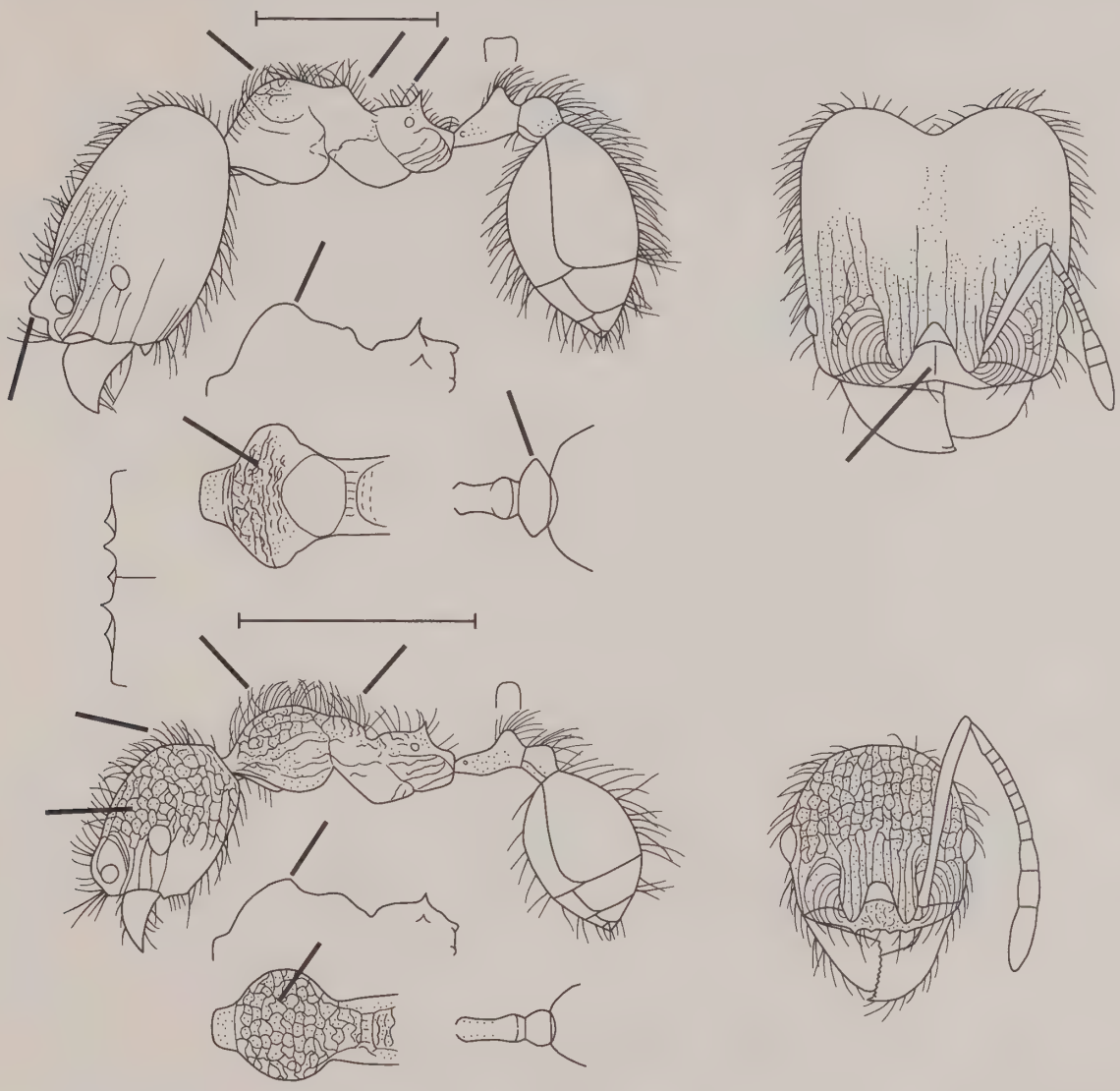
COLOR Major: head and mesosoma rich medium reddish brown; waist, gaster, and appendages yellowish brown.
Minor: body reddish yellow except for gaster, which is plain medium brown.

RANGE Known from the type colony as well as series collected at Yasuni National Park, Puerto Tiputini, Ecuador; and Cuzco Amazónico, near Puerto Maldonado, Madre de Dios, Peru.

BIOLOGY At Cuzco Amazónico, Peru, minor workers were found foraging on the ground and on top of a log in rainforest; one was carrying a termite worker (Stefan Cover and John E. Tobin). Winged queens were present in a nest at Yasuni National Park, Ecuador, in April (S. O'Donnell).

Compare with species listed in the Diagnosis below; see also *nasifer* and *rhinoceros*

FIGURE Upper: holotype, major. Lower: paratype, minor. VENEZUELA: Estado Aragua, Rancho Grande, 1100 m (William L. and Doris E. Brown). Scale bars = 1 mm.



Pheidole hortonae **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named in honor of Kathleen M. Horton, expert and indispensable contributor to the preparation of this *Pheidole* monograph.

DIAGNOSIS Similar to *antillana* of the lesser Antilles and *avia, bucculenta, guilelmimuelleri, hetschkoi, heyeri, mamore, praeses,* and *rhytifera* of South America, differing in the following combination of traits.

Major: antennal lobe prominent above clypeus in side view; pilosity on dorsal surface of body long, erect to suberect, and very dense, with many of those on pronotum curving backward and many of those on mesonotum curving forward; patch of rugoreticulum present laterad to antennal fossa; rear half of head capsule smooth and shiny; pronotal dorsum mostly rugoreticulate, and dorsum of mesonotum smooth and shiny.

Minor: posterior half of the head and all of the mesosomal dorsum rugoreticulate; pilosity long, erect to suberect, and very dense, with hairs on the pronotal dorsum curving backward and those on the mesonotum curving forward.

MEASUREMENTS (mm) Holotype major: HW 1.60, HL 1.66, SL 0.70, EL 0.18, PW 0.84.
Paratype minor: HW 0.70, HL 0.74, SL 0.70, EL 0.12, PW 0.48.

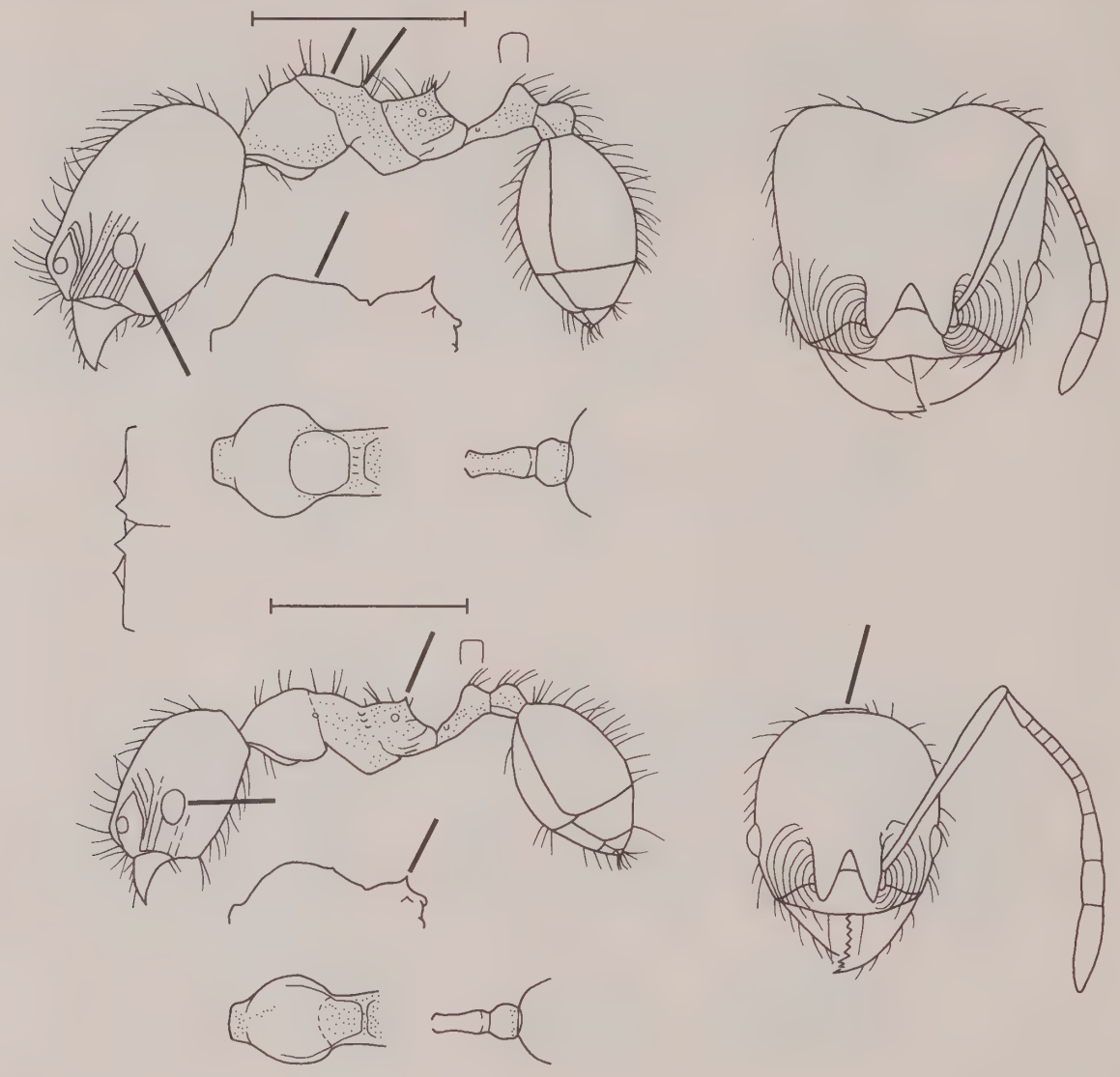
COLOR Major: body and mandibles medium reddish brown, other appendages brownish yellow.
Minor: body medium brown, appendages light brown except for tarsi, which are yellow.

RANGE Known only from the type locality.

BIOLOGY In rainforest.

Compare with *balzani, gaigei, godmani*

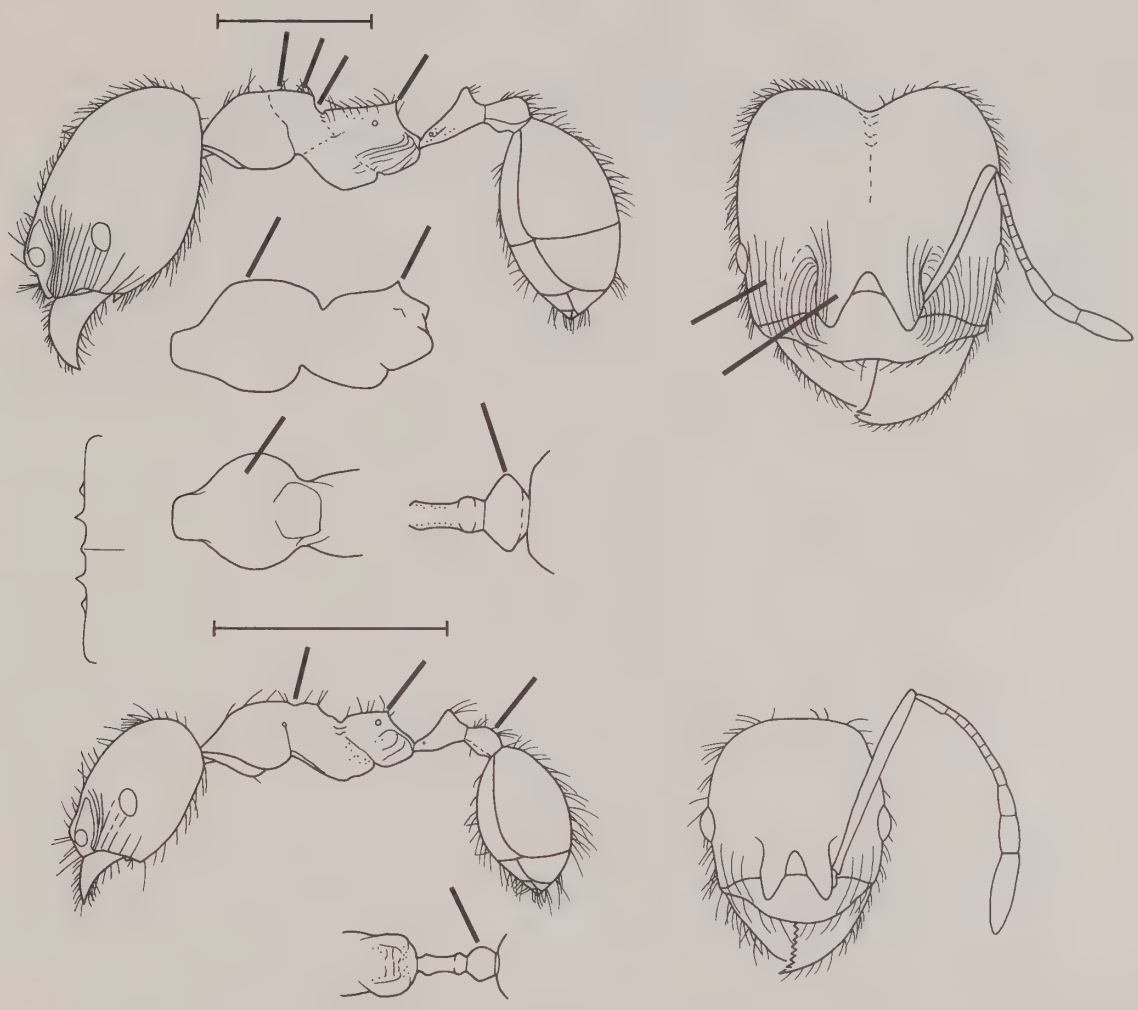
FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Parque Nacional Cuevas de los Guacharos, 10 km southeast of Palestina, Huila, 2200 m (C. Kugler and J. Hahn). Scale bars = 1 mm.



Pheidole huilana **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the Colombian department in which the type colony was collected.
DIAGNOSIS Similar in various traits to *balzani, gaigei,* and *godmani,* differing as follows.
Major: head very broad, with Head Width greater than Head Length, and tapering from occiput to clypeus; antennal scape long, approaching the occipital corner within about its own maximum width; eye large, set forward, Eye Length almost as great as the distance from eye to anterior genal border; promesonotal dorsum flat; mesonotal convexity very low; entire head posterior to eyes smooth and shiny.
Minor: eye large and set forward, with Eye Length equal to distance from eye to anterior genal border; occiput broad, yet with nuchal collar; propodeal spines reduced to denticles.
MEASUREMENTS (mm) Holotype major: HW 1.04, HL 1.00, SL 0.74, EL 0.20, PW 0.52.
Paratype minor: HW 0.56, HL 0.66, SL 0.76, EL 0.14, PW 0.34.
COLOR Major: body medium reddish brown, appendages dark yellow.
Minor: body yellowish brown, legs dark yellow.
RANGE Known only from the type locality.
BIOLOGY The colony was found in cloud forest, and included a male when collected on 16 January 1978.

FIGURE Upper: lectotype, major. Lower: paralectotype minor. (Type locality: "New Grenada," Greater Colombia.) Scale bars = 1 mm.



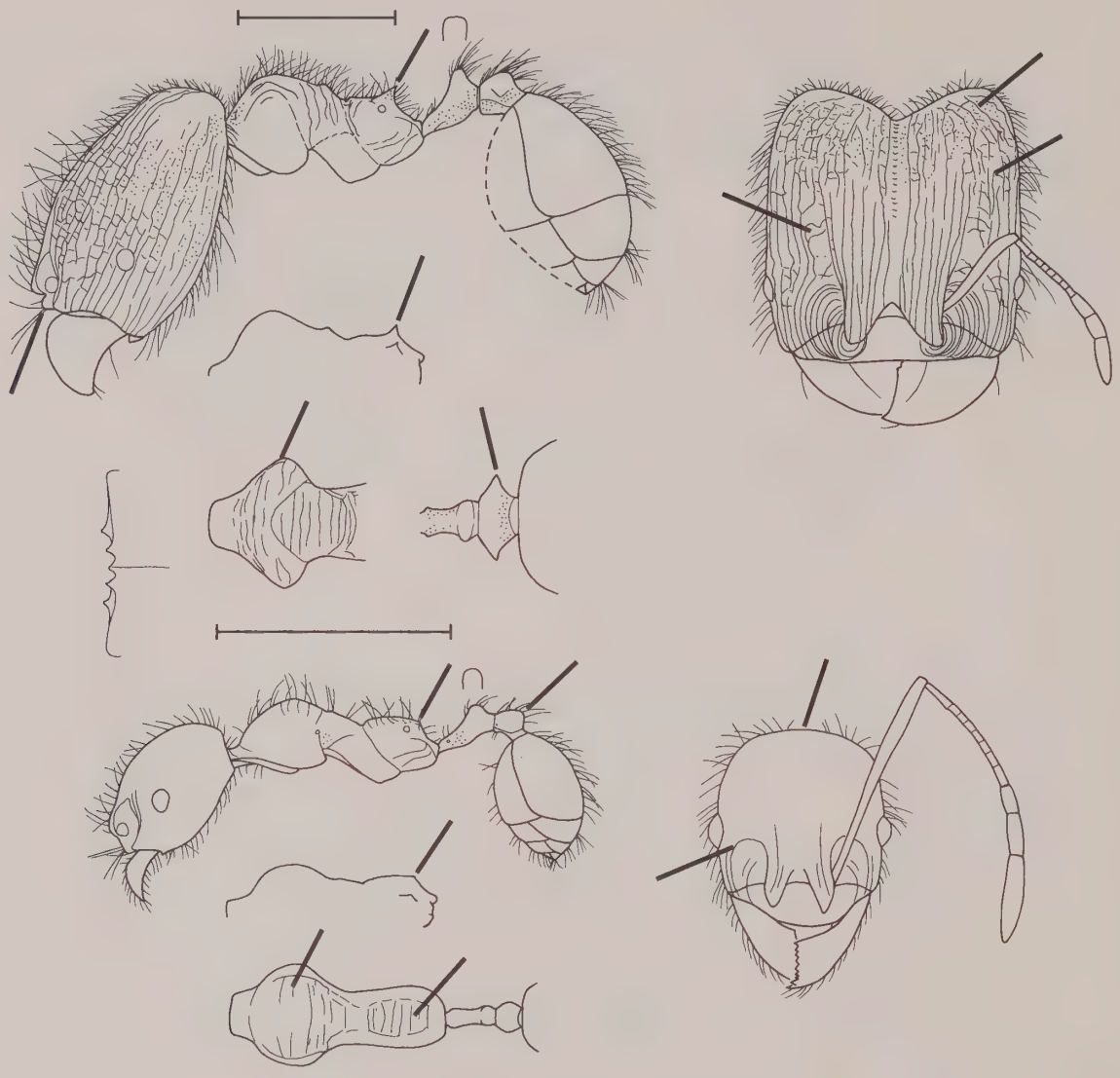
Pheidole incisa Mayr

Pheidole incisa Mayr 1870a: 401.

TYPES Naturhist. Mus. Wien.
ETYMOLOGY L *incisa,* cut into, probably alluding to the sharp descent of the mesonotum.
DIAGNOSIS Similar in various respects but not close to the species listed in the heading above.
Major: in side view the mesonotum descends in a vertical face to the metanotum, which may bear a very small convexity; head anterior to posterior margin of eye partly carinulate and rest of body smooth and shiny; humerus in dorsal-oblique view rounded or subangulate; propodeal spines equilaterally triangular.
Minor: head and body almost completely smooth and shiny; promesonotal profile almost perfectly semicircular; propodeal spines reduced to denticles; postpetiolar node from side low, and from above oval.
MEASUREMENTS (mm) Lectotype major: HW 1.52, HL 1.56, SL 0.90, EL 0.22, PW 0.70.
Paralectotype minor: HW 0.66, HL 0.74, SL 0.78, EL 0.12, PW 0.44.
COLOR Major and minor: concolorous brownish yellow.
RANGE Known only from Colombia, evidently montane.
BIOLOGY A series collected by W. L. and D. E. Brown between Mosquera and La Mesa, Cundinamarca, Colombia, were above 2000 m, in low montane forest.

Compare with *arachnion* and also *mamore* in the *scrobifera* group

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (Stefan Cover). Scale bars = 1 mm.



Pheidole iracunda **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *iracunda,* wrathful, inclined to anger.

DIAGNOSIS A member of the *tristis* group characterized by the following combination of traits.

Major: parts of sides of head covered by loose rugoreticulum, which becomes indistinct toward occiput; humeri and postpetiolar node seen from above cornulate; faint antennal scrobes present, their surfaces mostly bare.

Minor: propodeal spine reduced to an obtuse angle; body entirely smooth and shiny except for transverse carinulae that cover most of the dorsal surface of the mesosoma, and several carinulae on anterior half of dorsal surface of head, one of which loops on each side of the head in a semicircle from the end of the frontal lobe to the anterior clypeal border; nuchal collar absent.

Very similar to *arachnion* of Costa Rica but differing in details in the characters just cited.

MEASUREMENTS (mm) Holotype major: HW 1.66, HL 1.76, SL 0.72, EL 0.20, PW 0.84.

Paratype minor: HW 0.60, HL 0.64, SL 0.74, EL 0.12, PW 0.44.

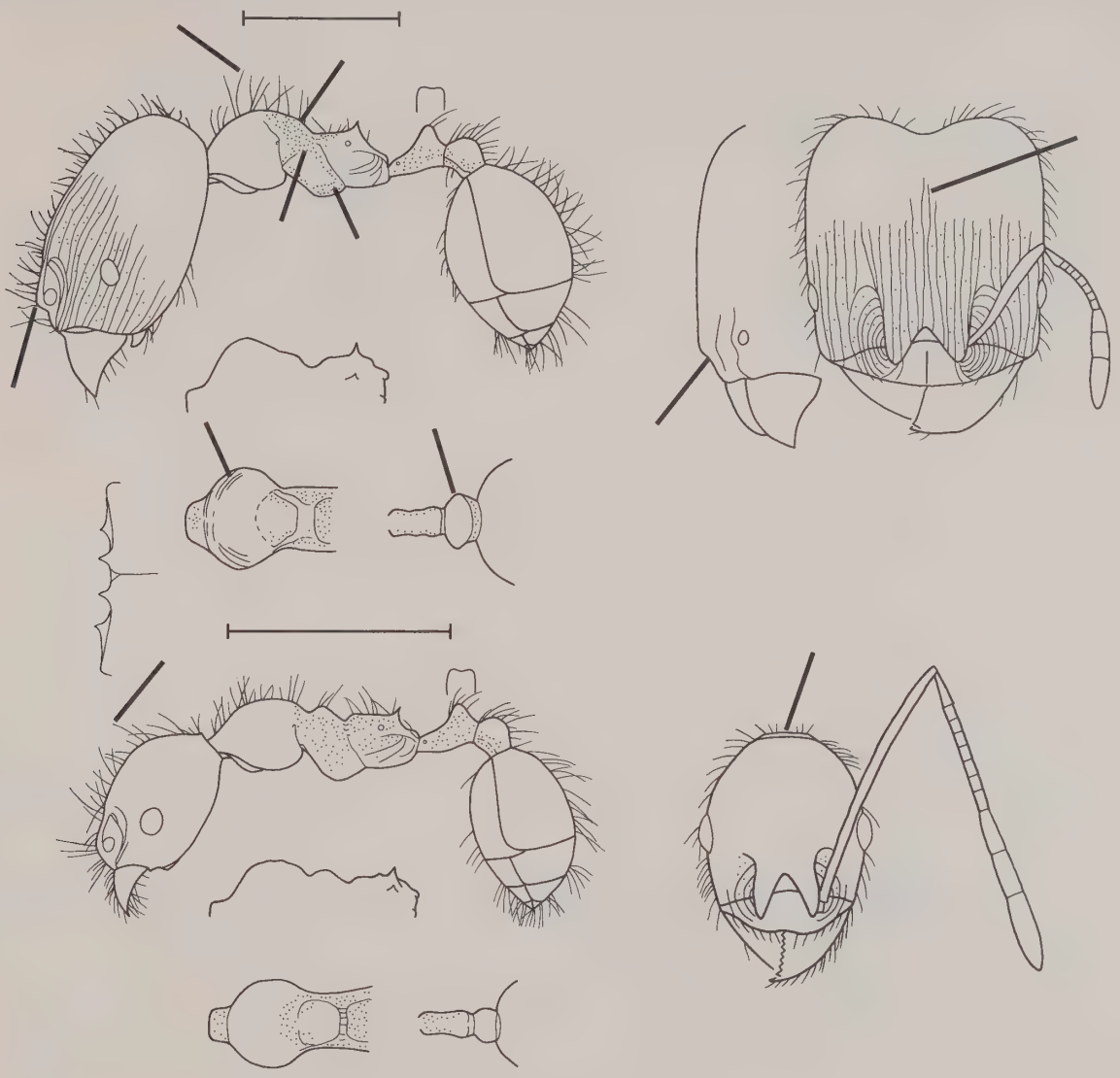
COLOR Major: body dark reddish brown, appendages light reddish brown.

Minor: most of body yellowish brown, gaster a slightly contrasting medium brown, appendages a lighter shade of yellowish brown.

RANGE Known only from the type locality.

BIOLOGY Three colonies were found at La Selva Biological Station nesting in rotten twigs. Two nests were on the floor of lowland rainforest, the third on the grassy, shaded floor of an arboretum adjacent to the forest. The colonies comprised fewer than 100 workers, and in two cases, a single queen. Seeds were found in one of the nests.

FIGURE Upper: holotype, major. Lower: paratype, minor. ECUADOR: Misahualli, Napo (C. Tarrant). Scale bars = 1 mm.

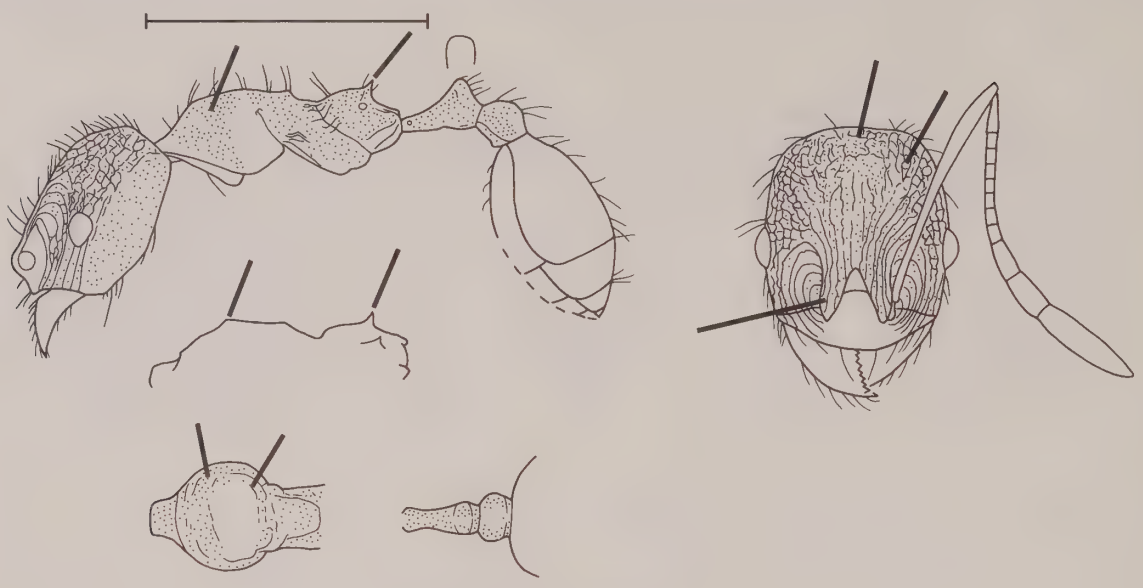


Pheidole jivaro **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the celebrated indigenous Amerindian tribe.
DIAGNOSIS Similar to other members of the "*carapuna* complex," listed above.
Major: a low, long convexity emerges from the midclypeus, as illustrated; pilosity long, with a few hairs on mesosomal dorsum over 1.5× Eye Length; mesonotal convexity very low, giving promesonotum in side view a newly smooth semicircular profile, postpetiole from above oval; almost all of posterior third of head smooth and shiny; anterior fringe of pronotum carinulate and most of mesopleuron foveolate.
Minor: occiput narrowed, with nuchal collar; pilosity long, with some hairs on dorsum of head greater than Eye Length.
MEASUREMENTS (mm) Holotype major: HW 1.06, HL 1.20, SL 0.60, EL 0.14, PW 0.54.
Paratype minor: HW 0.54, HL 0.70, SL 0.84, EL 0.14, PW 0.38.
COLOR Major: body and mandibles brownish yellow, other appendages plain dark yellow.
Minor: head and mesosoma dark brown; waist and gaster light to medium brown; mandibles and tarsi yellow; other appendages brownish yellow.
RANGE Known from the type locality and from Cerro Campana, Panama, 950 m (A. Newton).
BIOLOGY The Cerro Campana series was collected from leaf litter on the floor of rainforest. A winged queen was collected with the type colony on 29 June 1976.

Compare with species listed
in the Diagnosis below

FIGURE Lectotype, minor. COLOMBIA (no further data). Major: unknown. Scale bar = 1 mm.

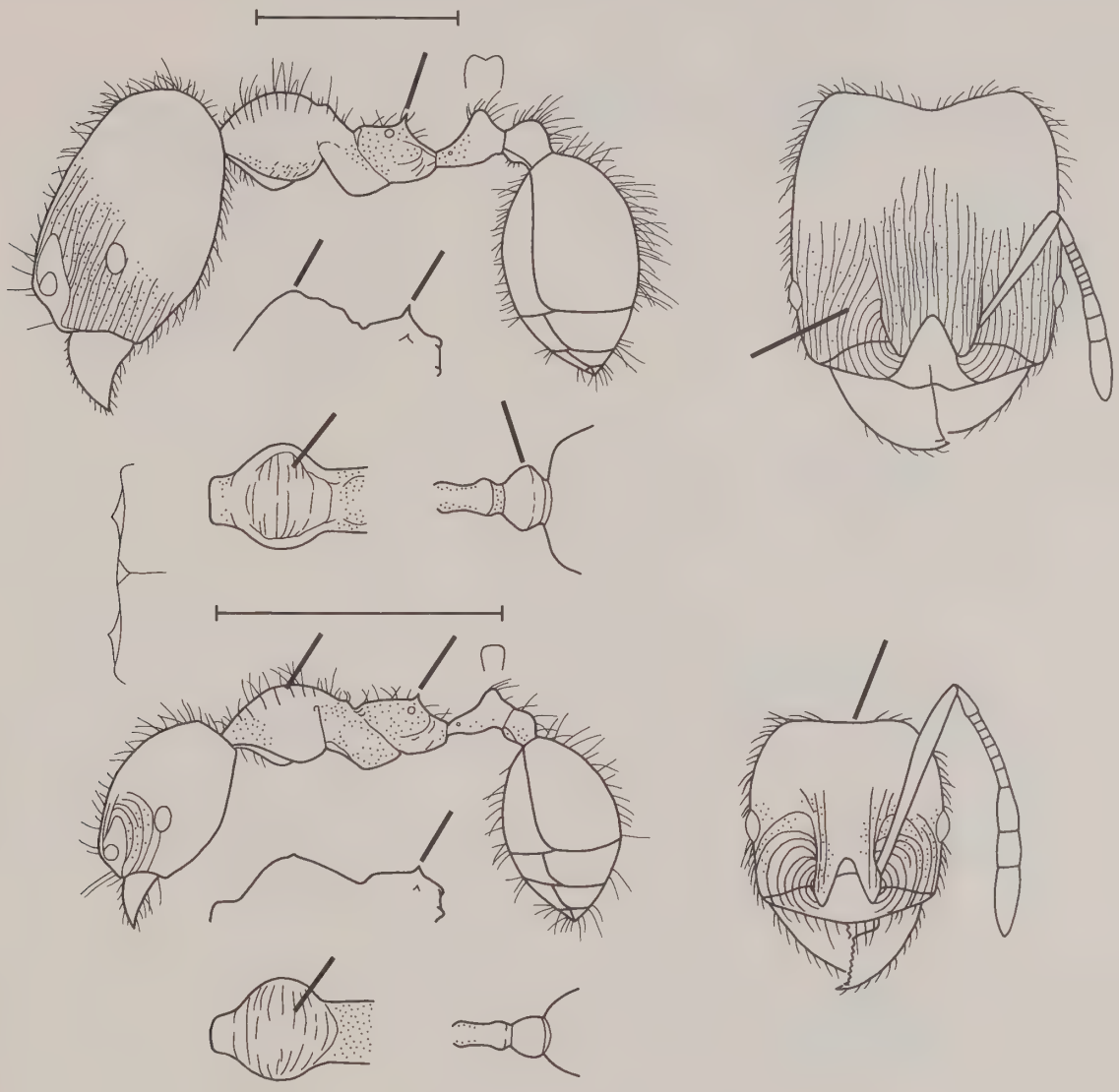


Pheidole laeviventris Mayr

Pheidole laeviventris Mayr 1870a: 401.

TYPES Naturhist. Mus. Wien.
ETYMOLOGY L *laeviventris,* smooth belly, referring to gaster.
DIAGNOSIS Similar to *aper, bambusarum, brevicona, dyctiota, lutzi, risii, rugatula, senilis, sigillata, trachyderma,* and *traini,* distinguished as follows.
Major: unknown.
Minor: occiput and sides of head rugoreticulate; vertex, antennal fossae, and frontal lobes carinulate; frontal triangle and midclypeus smooth; anterior and posterior thirds of pronotum foveolate, center smooth; occiput narrow, lacking nuchal collar or with rudiment only; humerus subangulate; propodeal spine equilaterally triangular.
MEASUREMENTS (mm) Lectotype minor: HW 0.66, HL 0.78, SL 0.82, EL 0.14, PW 0.40.
COLOR Minor: body concolorous medium reddish brown, appendages brownish yellow.
RANGE Known only from the type locality (Colombia, no further data).
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. DOMINICA, WEST INDIES: Morne Macaque, elfin forest on road to Fresh Water Lake, 1.5 km east of Laudat, about 800 m (M. E. and P. D. Perkins). Scale bars = 1 mm.

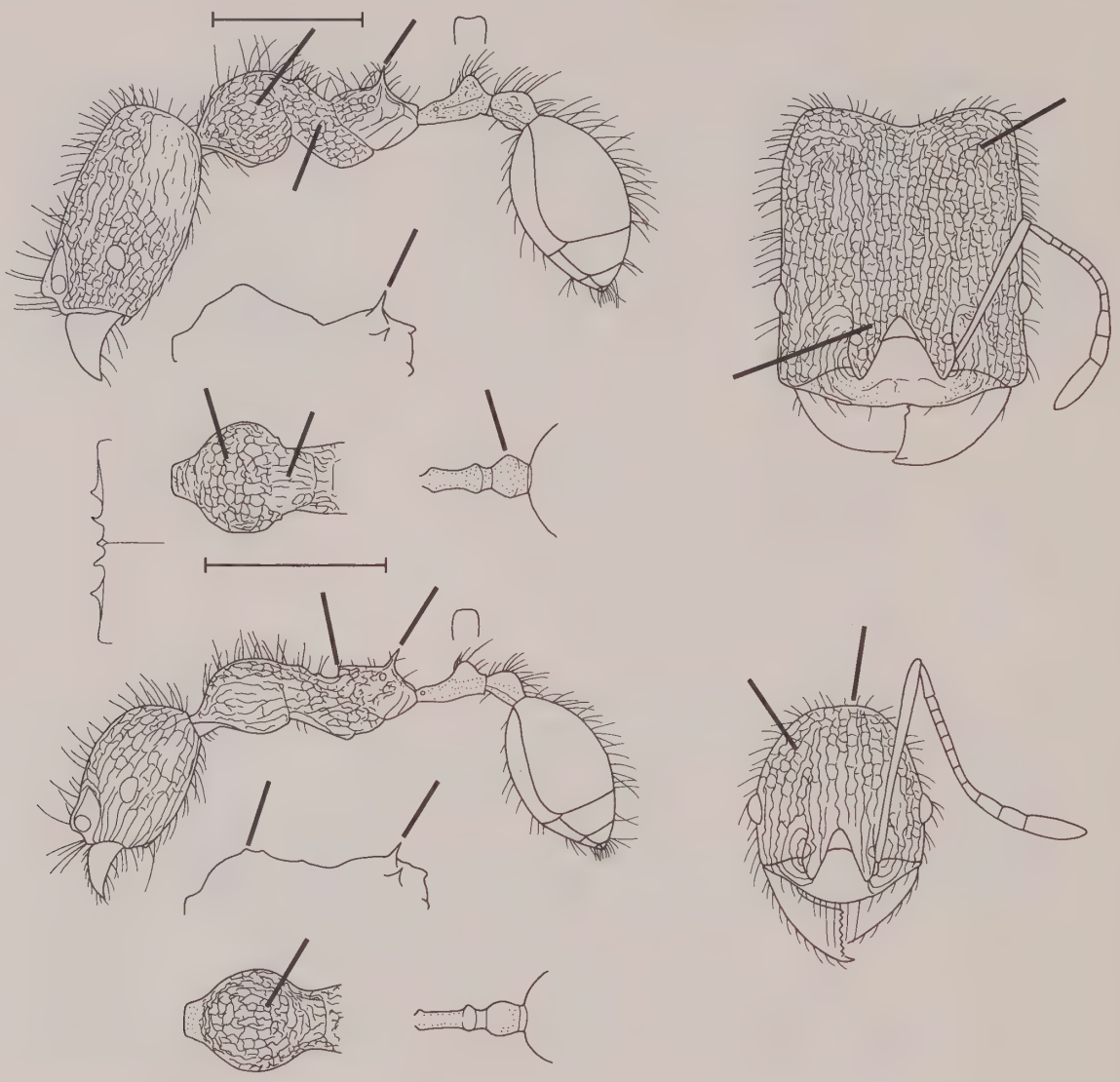


Pheidole laudatana **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Name based on the type locality.
DIAGNOSIS A member of the *tristis* group, and in particular the complex of West Indian species that include *alayoi, bakeri, macromischoides,* and *naylae* of Cuba, *hispaniolae* of the Dominican Republic, and *godmani* of St. Vincent, as well as their close relatives *sabina* of Mexico and *prattorum* of Costa Rica. Distinguished in the **major** and **minor** workers by a unique combination of traits in shape and sculpturing, especially in the head and mesonotum, size of the propodeal spine, overall pilosity, and other characters as shown.
MEASUREMENTS (mm) Holotype major: HW 1.12, HL 1.18, SL 0.72,. EL 0.12, PW 0.58.
Paratype minor: HW 0.58, HL 0.64, SL 0.64, EL 0.12, PW 0.34.
COLOR Major: body and mandibles light brown, other appendages yellow.
Minor: body light yellowish brown, mandibles and other appendages medium yellow.
RANGE Known only from the type locality in montane Dominica.
BIOLOGY The type series was collected in elfin forest.

Compare with species listed
in the Diagnosis below

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: Serra da Cantareira, São Paulo (Adolpho Lutz). Scale bars = 1 mm.

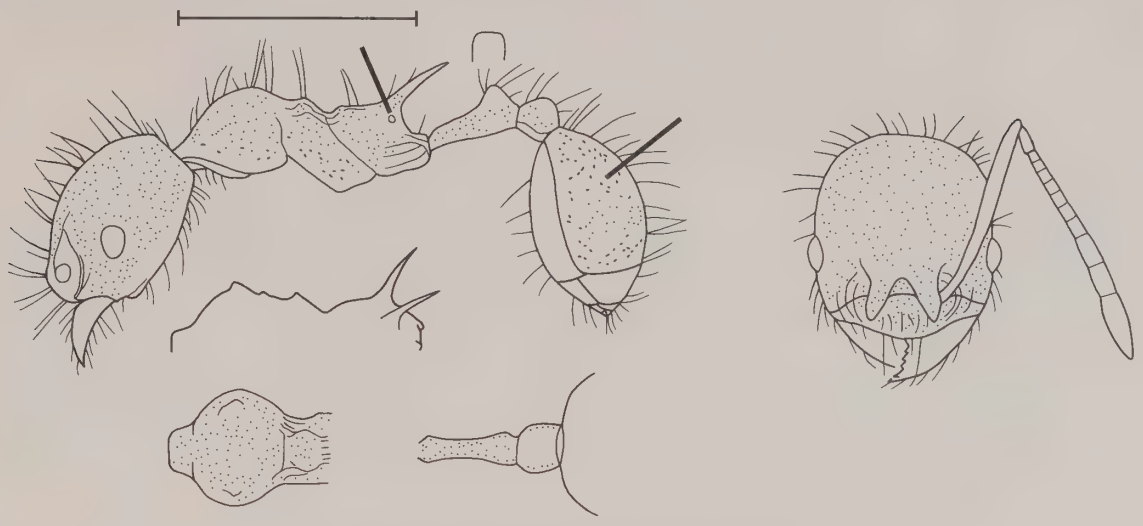


Pheidole lutzi Forel

Pheidole lutzi Forel 1905e: 168. Syn.: *Pheidole lutzi* var. *heinzi* Forel 1913m: 225, n. syn.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY Named after the collector, Adolpho Lutz.
DIAGNOSIS Similar in various traits to *aper, bambusarum, brevicona, dyctiota, laeviventris, risii, rugatula, senilis, sigillata, trachyderma,* and *traini,* differing as follows.
Major: head from the side and in full-face view subrectangular, elongate (Head Length 1.2× Head Width), expanded slightly anterior to eyes so that in full-face view the anterior margin is wider than the occiput; all of dorsal head surface, including frontal lobes rugoreticulate (except for antennal fossae, which are rugulose, and frontal triangle and midclypeus, which are smooth); all of promesothorax rugoreticulate; propodeal spines thin, one-third as long as propodeal basal face; postpetiole from above diamond-shaped.
Minor: most of dorsal head surface and all of promesothorax rugoreticulate; occiput strongly narrowed but with no nuchal collar; in side view propodeum descends to metanotum in vertical face.
MEASUREMENTS (mm) Lectotype major: HW 1.26, HL 1.54, SL 0.80,. EL 0.20, PW 0.74.
Paralectotype minor: HW 0.70, HL 0.84, SL 0.84, EL 0.12, PW 0.48.
COLOR Major: head, mesosoma, and antennae medium reddish brown; waist, gaster, and legs light reddish brown.
Minor: concolorous light reddish brown.
RANGE Known only from the type locality.
BIOLOGY The types were collected from a cavity in a bamboo trunk.

FIGURE Holotype, minor. PANAMA: Guipe (J. Zetek). Scale bar = 1 mm.

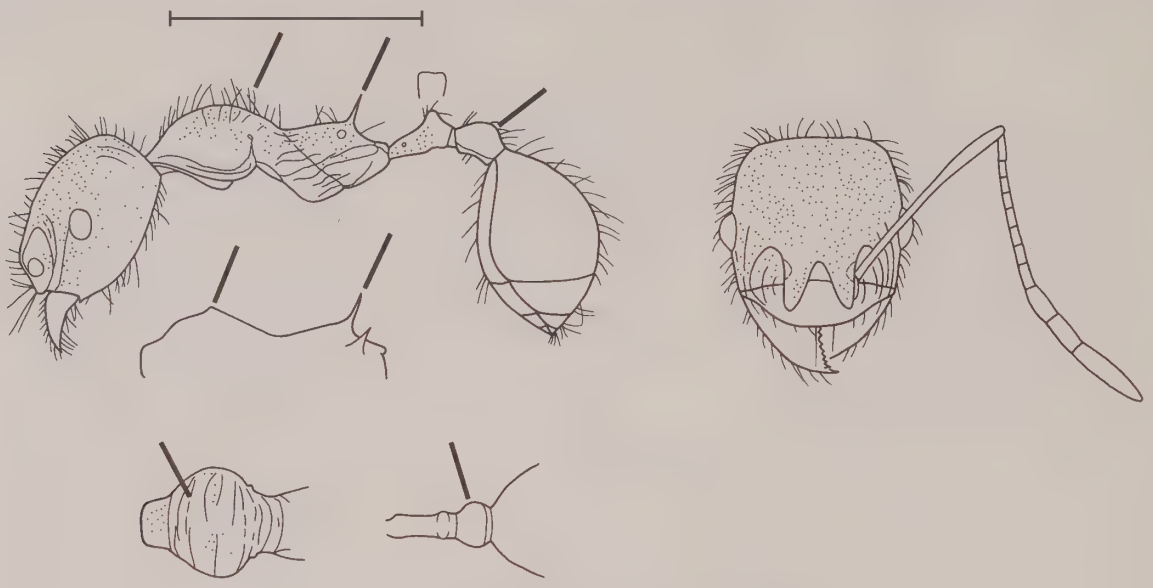


Pheidole macracantha **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *macracantha,* large thorn, alluding to propodeal spine.
DIAGNOSIS Tentatively placed in the *tristis* group because of its larger size, *macracantha* is similar to *cataphracta* of the *punctatissima* group, differing in the **minor** caste as follows: much larger; occiput in full face strongly convex instead of concave; pilosity denser and longer; first gastral tergite mostly shagreened.
MEASUREMENTS (mm) Holotype minor: HW 0.72, HL 0.76, SL 0.78, EL 0.12, PW 0.46.
COLOR Concolorous yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *alayoi, androsana, bakeri, cubaensis, naylae*

FIGURE Holotype, minor. (Major unknown.) CUBA: Los Acostas, Pinar del Rio (E. O. Wilson). Scale bar = 1 mm.



Pheidole macromischoides **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *macromischoides,* like *Leptothorax (= Macromischa).*

DIAGNOSIS **Major**: unknown.

Minor: medium-sized brown member of the *tristis* group with long, straight, needle-like propodeal spines; low postpetiolar node, promesonotum smoothly rounded in profile; humerus with low subangle in dorsal-oblique view; bell-shaped postpetiole; broken transverse carinulae covering pronotal dorsum; and dorsa of head and mesosoma foveolate and opaque.

Similar to the minor workers of *alayoi, bakeri, cubaensis,* and *naylae* of Cuba and *androsana* of the Bahamas, differing in many details of body form, sculpturing, and pilosity, as illustrated, and color.

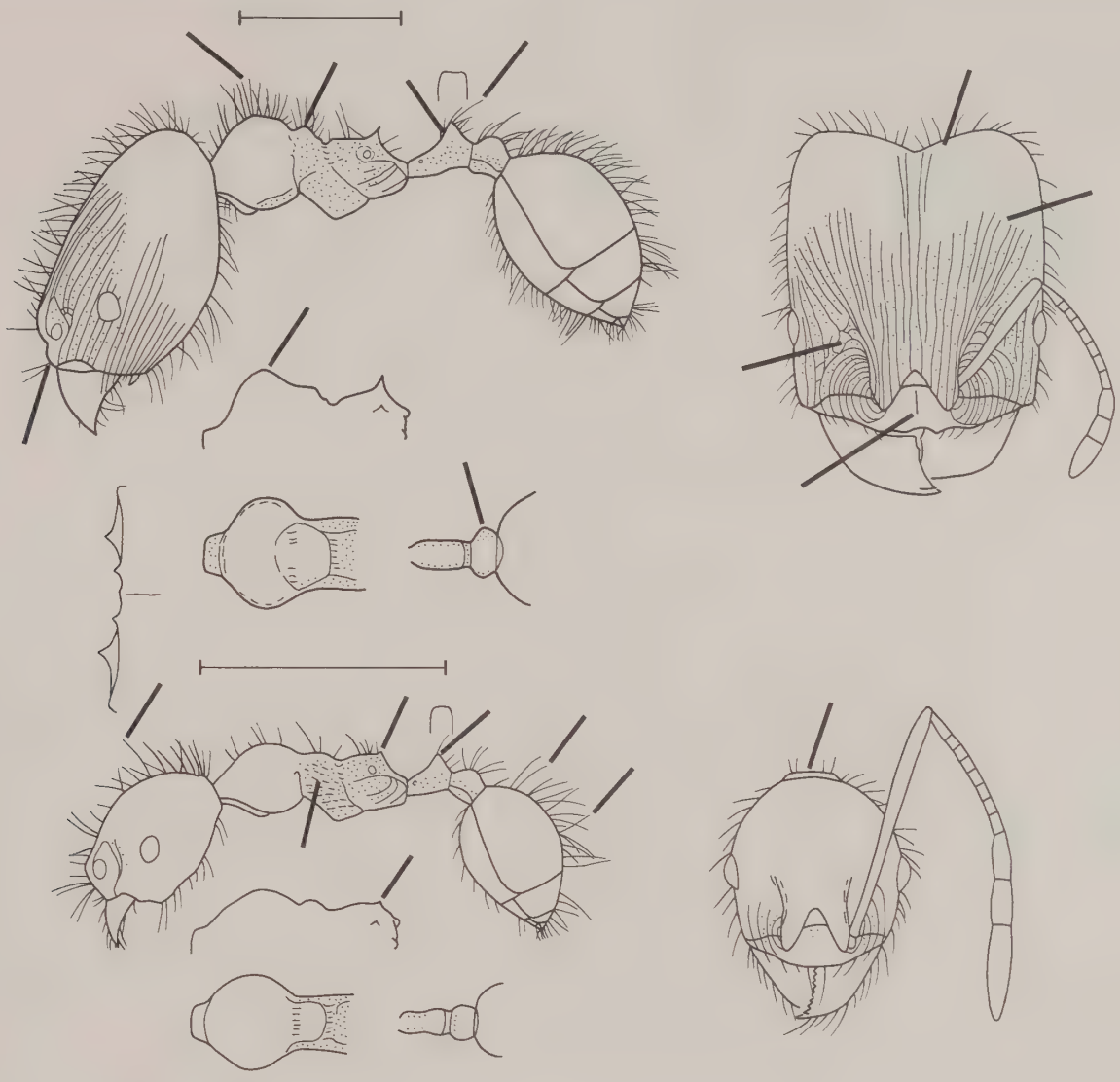
MEASUREMENTS (mm) Holotype minor: HW 0.62, HL 0.68, SL 0.76, EL 0.12, PW 0.44.

COLOR Minor: concolorous medium brown, with appendages a shade lighter.

RANGE Known only from the type locality.

BIOLOGY Foraging during the day on a limestone block about 2 meters high at side of the road 15 meters from a cliff of a *magote*, one of the limestone outcroppings at Los Acostas (this one was behind the "new" Rancho de San Vicente, west of the road, as of 1953). The workers looked and moved like the distinctive *Leptothorax* workers of species formerly placed in the synonymous *Macromischa,* which were abundant on and around the *mogotes* (E. O. Wilson).

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Estacion Biologica de Cocha Cashu, Madre de Dios, 400 m (Diane W. Davidson). Scale bars = 1 mm.

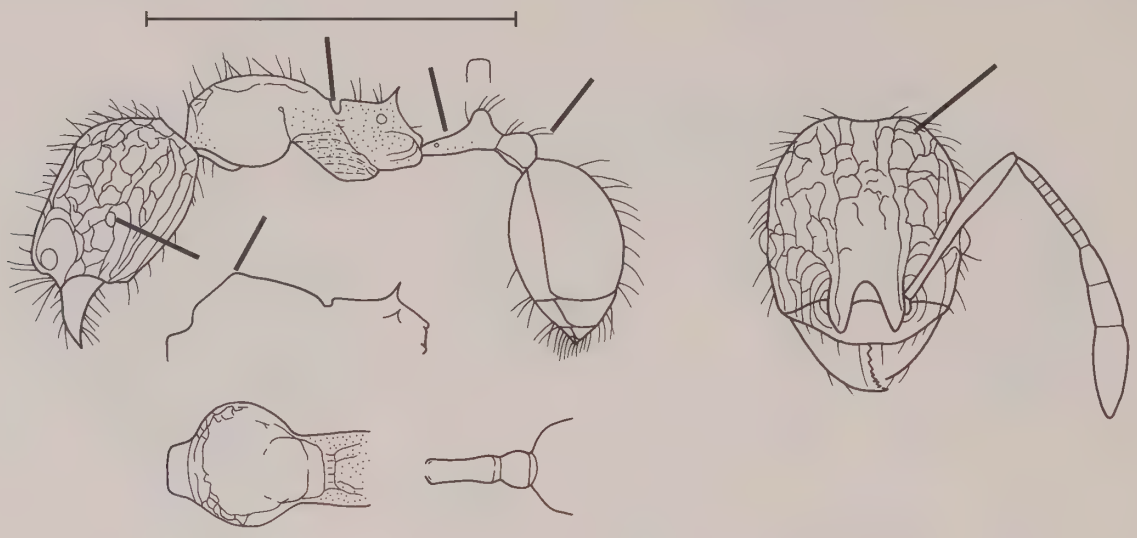


Pheidole manuana **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after Manu National Park, origin of the type colony.
DIAGNOSIS **Major**: head subrectangular in full-face view; middle longitudinal carina of clypeus raised into a low ridge; mesonotal convexity prominent, but humerus more so, in dorsal-oblique view raised as a lobe twice as high above metanotum as the mesonotal convexity; petiolar node tapered to a subangle at apex in side view; postpetiole oval from above; rugoreticulum present posterior to antennal fossa on each side of head; rear third of head smooth except for several carinulae that run parallel along the dorsal midline to the occiput; pilosity dense and long.
Minor: occiput narrowed, with nuchal collar; pilosity very long, with some hairs 2× Eye Length; propodeal spines reduced to denticles; mesopleuron foveolate and weakly carinulate.
MEASUREMENTS (mm) Holotype major: HW 1.40, HL 1.62, SL 0.70, EL 0.20, PW 0.66.
Paratype minor: HW 0.54, HL 0.62, SL 0.76, EL 0.10, PW 0.34.
COLOR Major: body and mandibles brownish yellow, legs and antennae clear dark yellow.
Minor: body plain light brown, appendages dark yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *fimbriata*

FIGURE Unique holotype, minor. PERU: near Lake Sandoval, Puerto Maldonado, Madre de Dios, 260 m (Charles Kugler and R. R. Lambert). Scale bar = 1 mm.

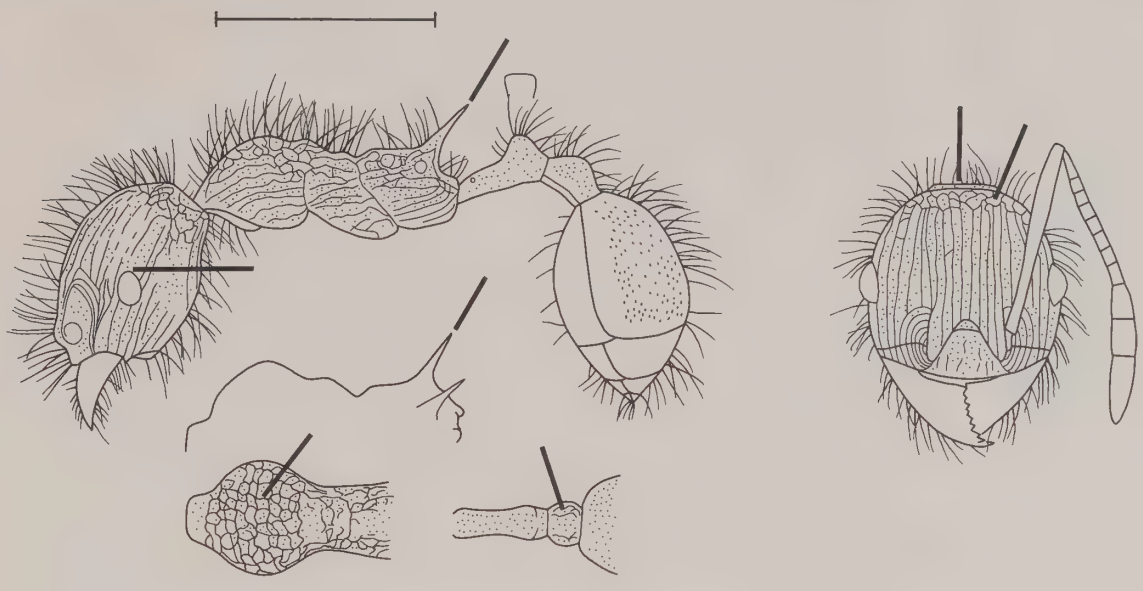


Pheidole microps **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *microps,* small eyes.
DIAGNOSIS Somewhat similar to *fimbriata*. Known only from the minor, which is readily distinguished from all other *Pheidole* species by its tiny eyes, yellow color, angulate anterior dorsal margin of the propodeum in side view, elongate petiolar peduncle, very loosely rugoreticulate dorsum of the head, and rugoreticulate anterior and lateral edges of the pronotum.
MEASUREMENTS (mm) Holotype minor: HW 0.48, HL 0.52, SL 0.44, EL 0.02, PW 0.32.
COLOR Yellow.
RANGE Known only from the type locality.
BIOLOGY Collected from leaf litter on sandy soil, lowland rainforest.

Compare with *horribilis, macromischoides, terribilis, ursus* and species around them (q.v.)

FIGURE Holotype, minor. PERU: Estacion Biologia Cocha Cashu, Manu National Park, Madre de Dios, 400 m (Diane W. Davidson). Major unknown. Scale bar = 1 mm.

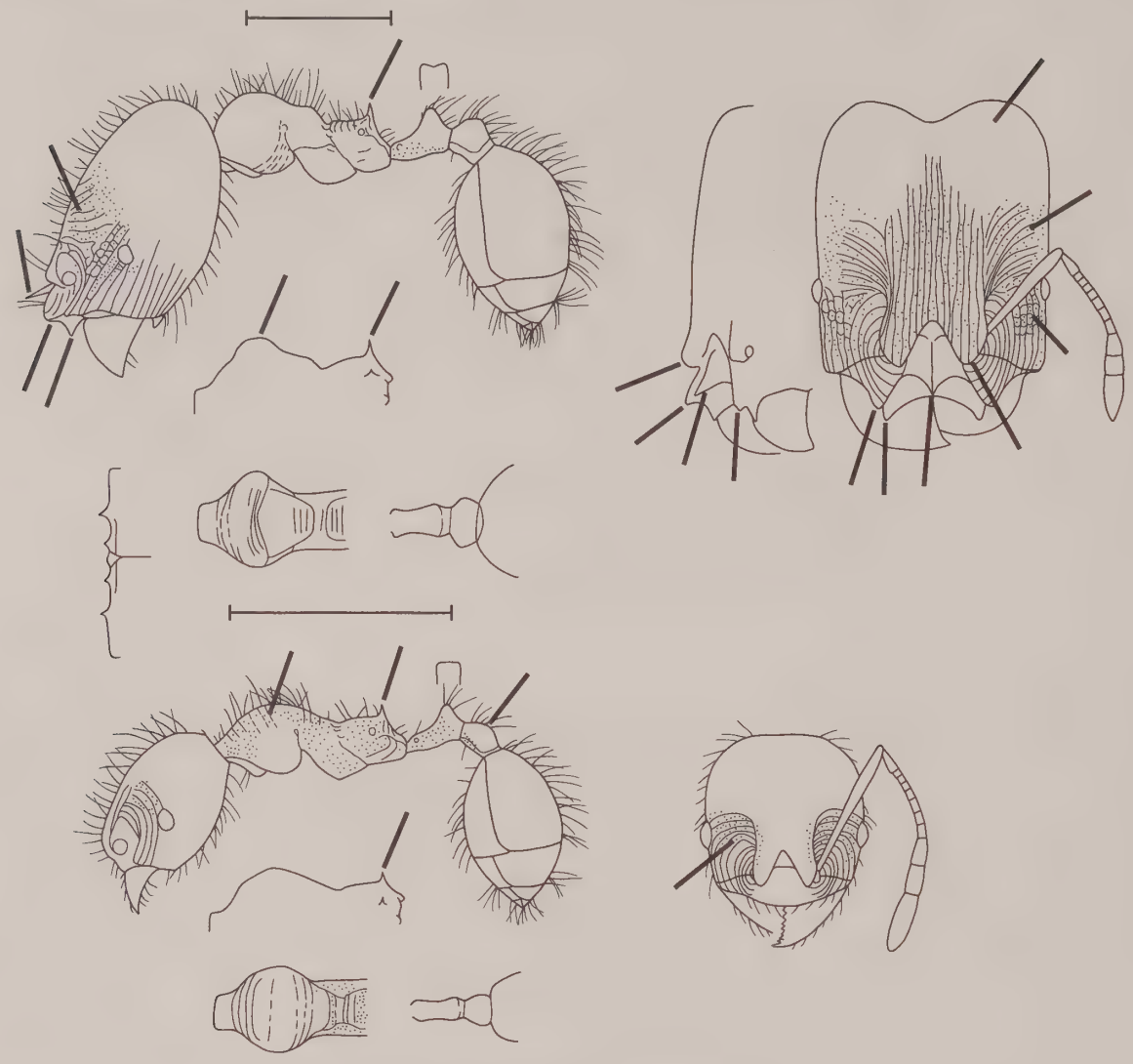


Pheidole minax **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *minax,* threatening.
DIAGNOSIS Similar to species listed in heading above, with following differences.
Major: unknown.
Minor: occiput narrow, with nuchal collar, and rugoreticulate; most of rest of dorsal head surface rugulose, only locally and weakly reticulate; propodeal spines as long as propodeal basal face; promesonotum rugoreticulate; postpetiolar dorsum rugulose; all of central strip of first gastral tergite shagreened.
MEASUREMENTS (mm) Holotype minor: HW 0.84, HL 0.82, SL 0.90, EL 0.16, PW 0.58.
COLOR Minor: body medium reddish yellow, appendages light reddish yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *binasifer, diabolus, gravida, moseni, mosenopsis, nasifer, rhinoceros, unicornis*

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Pance, Mun. de Cali, Valle, 1700 m (W. L. Brown and S. Chaplin). Scale bars = 1 mm.



Pheidole mirabilis **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *mirabilis,* wonderful, strange, alluding to the armament of the major.

DIAGNOSIS Similar to the species listed in the heading above but unique among *Pheidole,* and all ants, for the complex armament at the front of the major's head.

Major: a spike emerges from the middle carina of the clypeus; the clypeus divides into two layers, each of which projects a pair of angulate processes down and forward; carinulae originating on the frontal carinae turn outward and travel toward the sides of the head; rugoreticulum present mesad to eye; most of posterior third of dorsal head surface smooth; propodeal spines vertical to propodeal basal face.

Minor: dorsal mesosomal surface mostly covered by widely spaced transverse carinulae; propodeal spines vertical to propodeal basal face; postpetiolar node low in side view.

MEASUREMENTS (mm) Holotype major: HW 1.24, HL 1.64, SL 0.64, EL 0.14, PW 0.70.
Paratype minor: HW 0.64, HL 0.74, SL 0.62, EL 0.10, PW 0.42.

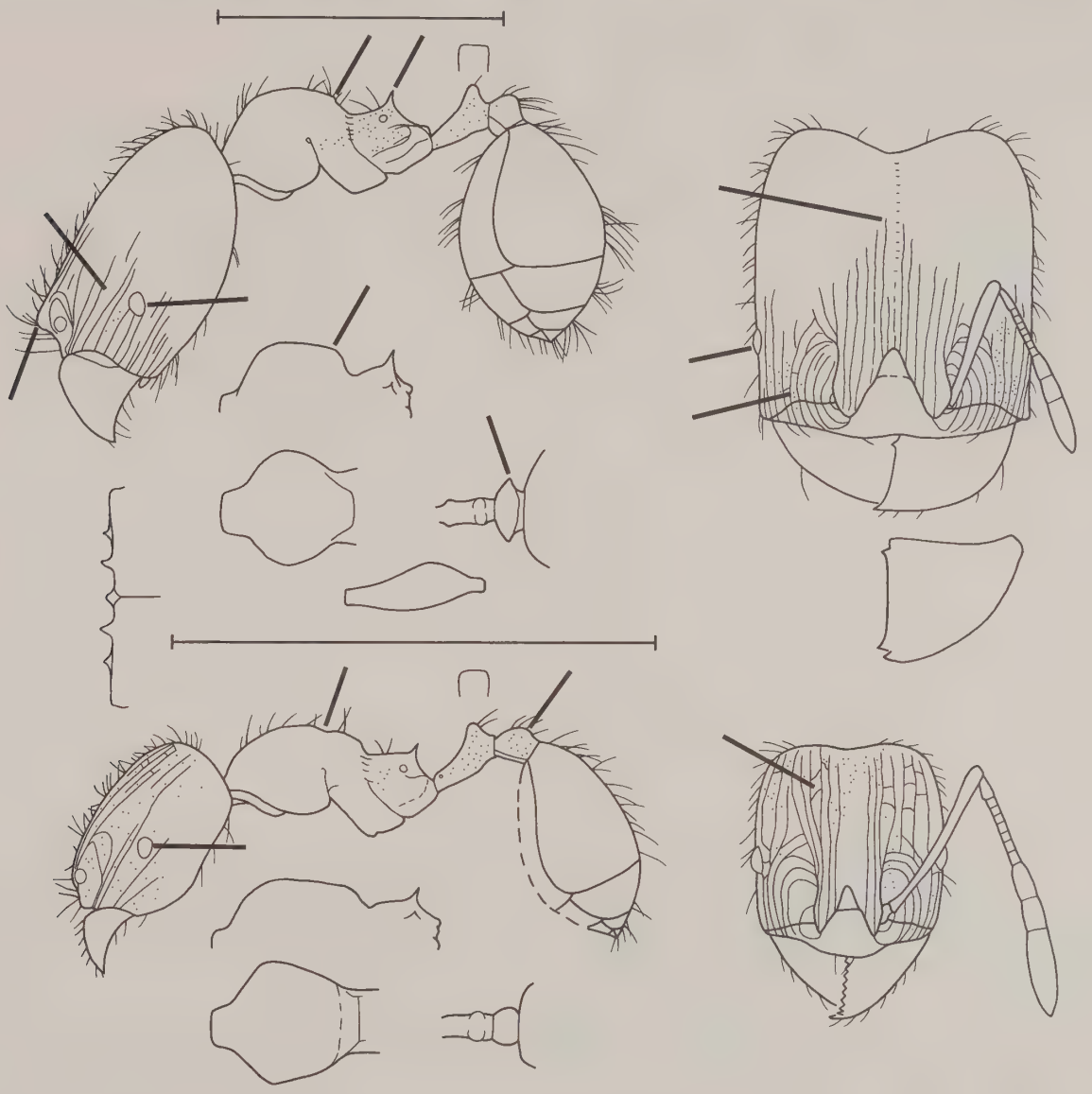
COLOR Major: body medium reddish brown, legs yellowish brown.
Minor: body plain medium brown except for gaster, which is plain light brown; appendages yellowish brown.

RANGE Known from three localities in Valle, at 1570–1700 m.

BIOLOGY All of the three series were collected in montane rainforest. A seed cache was found in the nest of the type colony.

Compare with *binasifer, diabolus, gravida, mirabilis, mosenopsis, nasifer, rhinoceros, unicornis*

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. BRAZIL: no further locality. Scale bars = 1 mm.



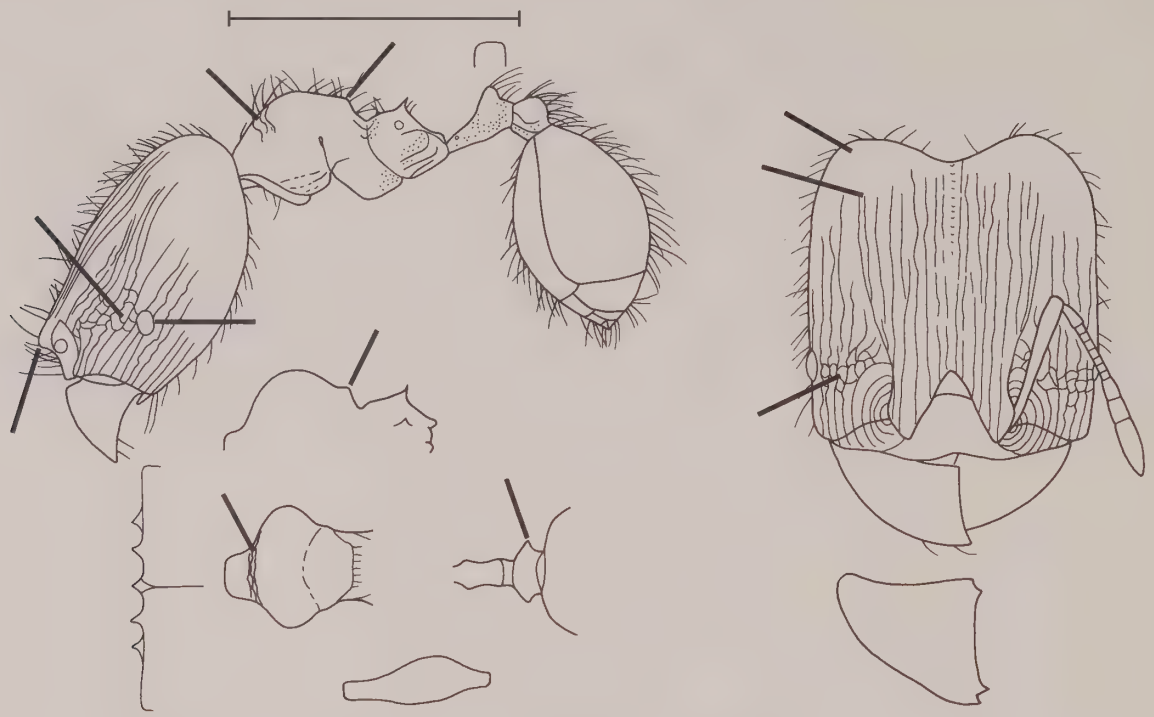
Pheidole moseni Wheeler

Pheidole moseni Wheeler 1925a: 21.

TYPES Mus. Comp. Zool. Harvard; Roy. Mus. Stockholm.
ETYMOLOGY Eponymous.
DIAGNOSIS Similar in various ways to the species listed in the heading above, distinguished as follows.
Major: small; brownish yellow; frontal lobes project as rounded right angles forward and downward from head profile; eyes small, Eye Length much less than one-tenth Head Width; posterior half of head and all of pronotum smooth and shiny; rugoreticulum nowhere present on head; promesonotum drops through a steep posterior face to the metanotum; postpetiolar node from above 2× as wide as petiolar node, and spinose.
Minor: eyes very small, Eye Length much less than one-tenth Head Width; almost all of dorsal head surface, excluding occipital edge, frontal triangle, and midclypeus, carinulate; almost all of mesosoma smooth.
MEASUREMENTS (mm) Lectotype major: HW 0.86, HL 0.96, SL 0.20, EL 0.06, PW 0.50.
Paralectotype minor: HW 0.44, HL 0.46, SL 0.38, EL 0.04, PW 0.28.
COLOR Major and minor: concolorous brownish yellow.
RANGE Known from the types, of uncertain provenance in Brazil, and from "Reserva Nova Lombardia," 4 km north of Santa Teresa, Espirito Santo, 900 m (W. L. Brown).
BIOLOGY The Espirito Santo colony was collected in montane forest.

Compare with *binasifer, diabolus, gravida, mirabilis, moseni, nasifer, rhinoceros, unicornis*

FIGURE Holotype, major. BOLIVIA: near radio station, Caranavi, Cordallera Real, La Paz, 800 m (Charles Kugler). (Minor not illustrated; see description below in the Diagnosis). Scale bar = 1 mm.



Pheidole mosenopsis **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *mosenopsis,* resembling *mosen(i)* (q.v.).

DIAGNOSIS Similar in various characters to the species listed in the heading above, especially *moseni,* and distinguished as follows.

Major: frontal lobes extend forward as rounded subangular processes in side view; eyes very small, Eye Length much less than one-tenth Head Width; rugoreticulum present on each side of head from eye to antennal fossa; carinulae cover all of posterior dorsal surface of head except occiput; anterior strip of pronotal dorsum transversely rugulose-carinulate, and almost all of the rest of mesosoma smooth and shiny.

Minor (Canindeyú, Paraguay): proportionately small, and small-eyed; promesonotum in side view smoothly and strongly convex; almost all of dorsal surface of head carinulate and foveolate; lower half of mesopleuron smooth, remainder of mesosoma almost all smooth; propodeal spines small, equilaterally triangular.

MEASUREMENTS (mm) Holotype major: HW 0.82, HL 0.92, SL 0.38, EL 0.06, PW 0.46.

Minor (Canendiyú, Paraguay): HW 0.42, HL 0.46, SL 0.40, EL 0.04, PW 0.24.

COLOR Major: head and mandibles dark reddish brown, mesosoma and gaster plain medium brown, waist yellowish brown, antennae and legs medium yellow.

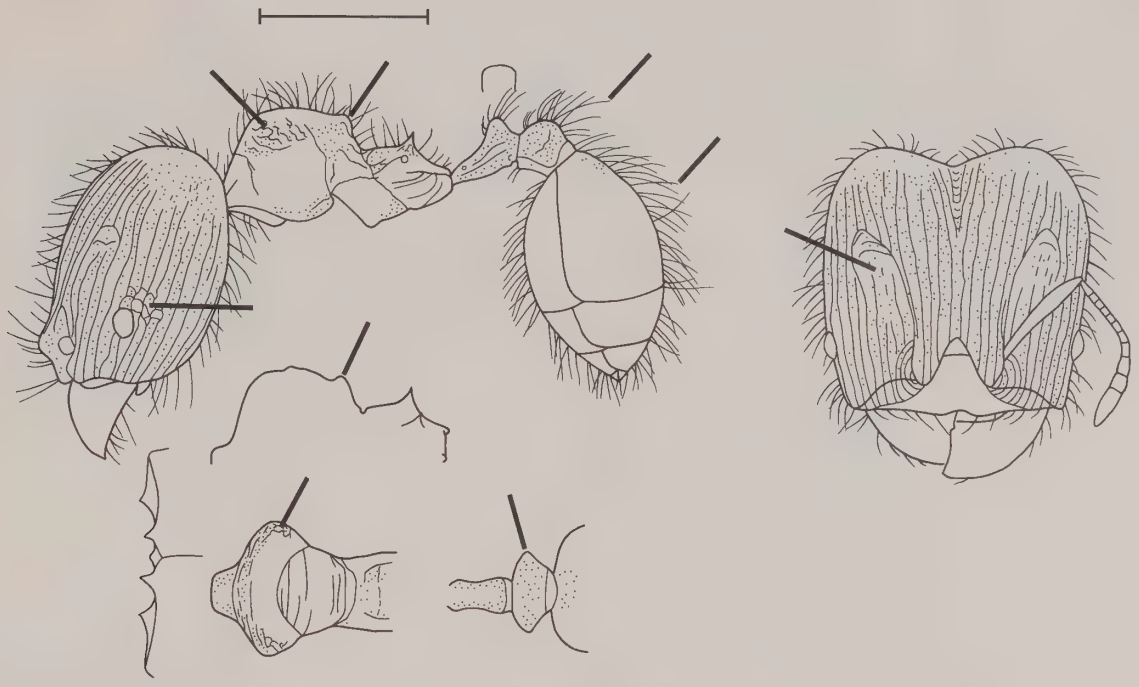
Minor (Paraguay): body dark yellowish brown, appendages medium yellow.

RANGE Known from the type locality and from Reserva Mbaracayú, Jejuimi, Canendiyú, Paraguay.

BIOLOGY The Paraguayan colony was collected in forest leaf litter.

Compare with species listed in the Diagnosis below

FIGURE Unique holotype, major. ECUADOR: 20 kilometers south of Tena, Napo, 600 m (Stewart and Jarmila Kukalová-Peck). Scale bar = 1 mm.



Pheidole napoensis **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named after the Ecuadoran province of origin.

DIAGNOSIS A striking, large member of the *tristis* complex, similar to *bellatrix* of Colombia and more distantly so to *pepo, rotundiceps, sphaerica,* and *subsphaerica,* variously from Colombia and Ecuador, and distinguished as follows.

Major: promesonotum in side view forms a very large hump towering over the propodeum; antennal scrobes present; humeri very broad and rugoreticulate; postpetiolar node conulate; a patch of rugoreticulum present behind and below the eye.

Minor: unknown.

MEASUREMENTS (mm) Holotype major: HW 1.70, HL 1.70, SL 0.72, EL 0.20, PW 0.92.

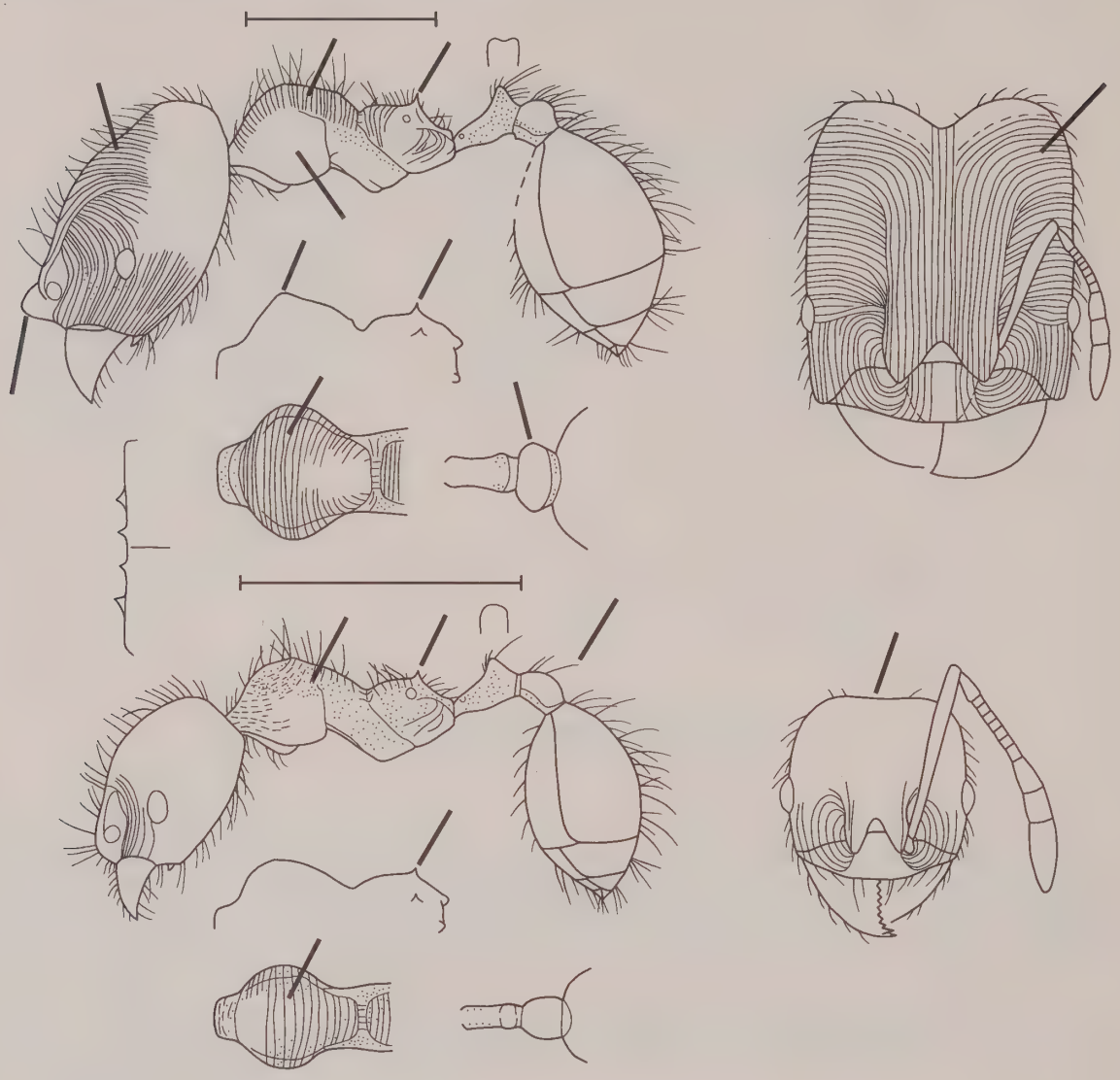
COLOR Major: body and mandibles very dark reddish brown, other appendages brownish yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

Compare with *binasifer, diabolus, gravida, mirabilis, moseni, mosenopsis, rhinoceros, unicornis*

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: vicinity of Tingo Maria, Huáuco (W. L. Brown and W. Sherbrooke). Scale bars = 1 mm.



Pheidole nasifer **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *nasifer,* bearing a nose, referring to the nose-like protrusion of the median clypeal carina of the major in side view.

DIAGNOSIS A medium-sized member of the *tristis* group similar and in various ways to the species listed in the heading, but sharply distinguished as follows.

Major: a single "nose" (the median carina of the clypeus) protrudes in side view, not accompanied by the frontal lobes; all of dorsal surface of head except occiput covered by carinulae, with those originating from the frontal lobes and along the frontal carinae turning outward to travel to the sides of the head; pronotal dorsum transversely carinulate; petiolar node from above oval.

Minor: propodeal spines reduced to denticles; mesosomal dorsum almost completely covered by transverse carinulae; postpetiolar node depressed, and postpetiole cylindrical in overall shape; occipital margin broad and weakly concave.

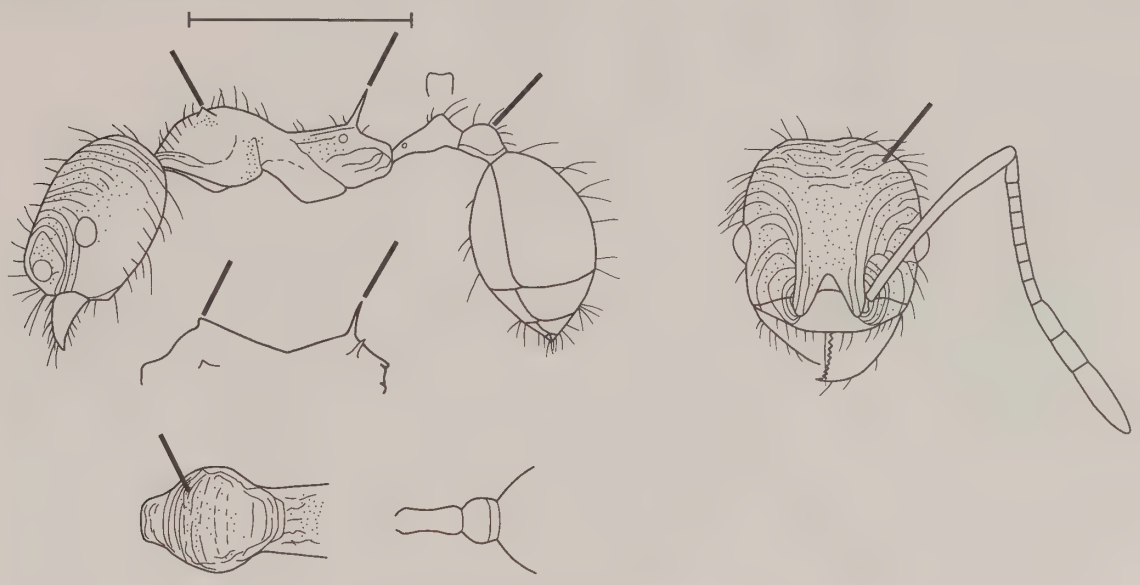
MEASUREMENTS (mm) Holotype major: HW 1.16, HL 1.32, SL 0.64, EL 0.18, PW 0.68.
Paratype minor: HW 0.56, HL 0.62,. SL 0.56, EL 0.10, PW 0.36.

COLOR Major: concolorous plain medium brown.
Minor: body dark brown, appendages medium brown.

RANGE Known only from the type locality.

BIOLOGY The nest of the type colony contained a cache of small seeds.

FIGURE Holotype, minor. (Major unknown.) CUBA: "El Poal," Jaguaní, Guantanamo (A. Perez). Scale bar = 1 mm.

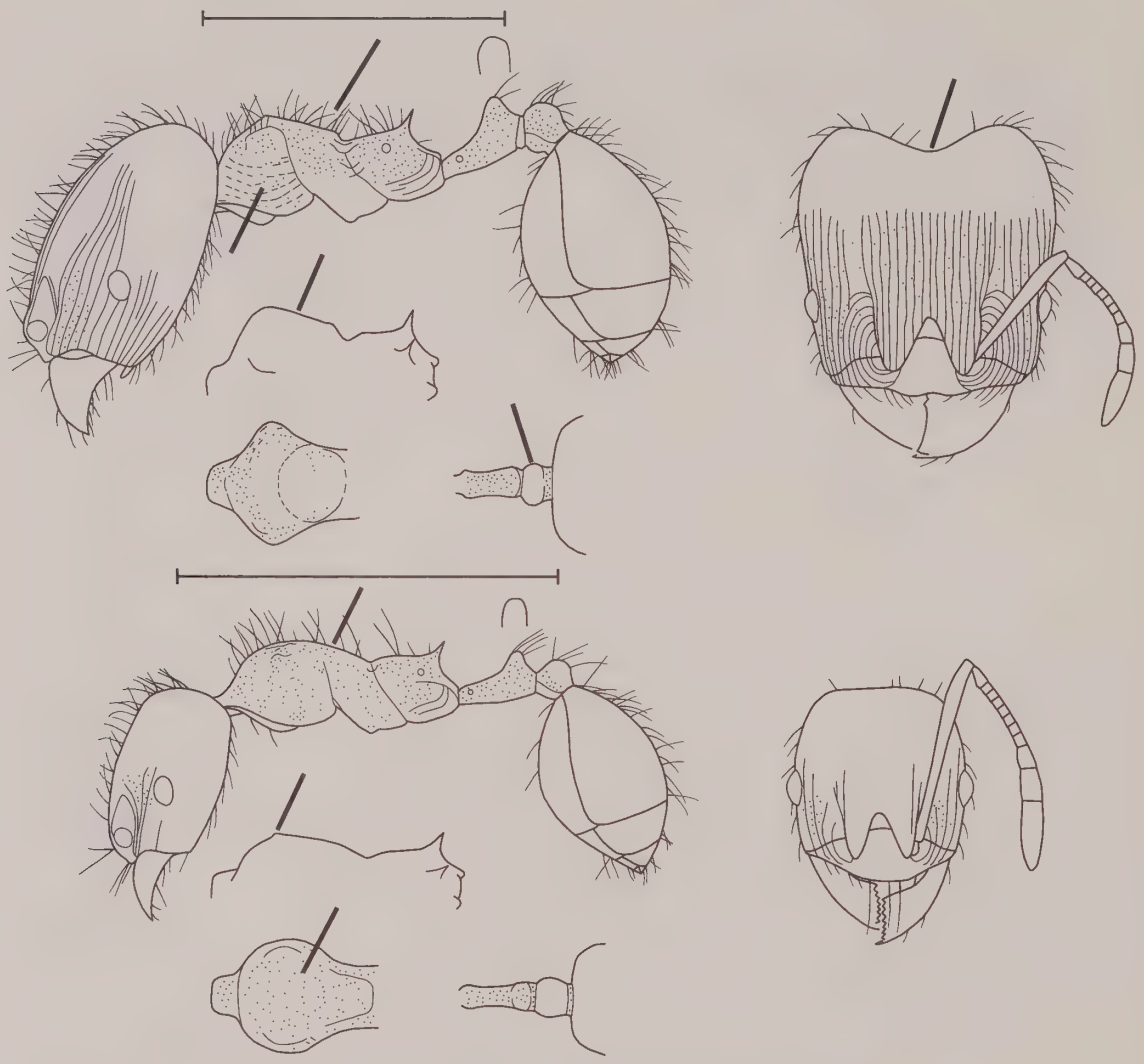


Pheidole naylae **new species**

TYPES Mus. Comp. Zool. Harvard and collection of the Cuban myrmecologist J. Fontenla.
ETYMOLOGY In honor of Nayla Fontenla.
DIAGNOSIS **Major**: unknown.
Minor: a medium-sized yellowish brown member of the *tristis* group, whose minor has very long, straight needle-like propodeal spines, prominent teeth on the humerus, low petiole that is bell-shaped from above, and parallel transverse carinulae and rugulae covering the sides of the head, the occiput, and most of the pronotal dorsum.
Similar to the minor workers of *alayoi, cubaensis,* and *macromischoides* of Cuba and *androsana* of the Bahamas, differing in many traits of body form, sculpturing, and pilosity, as illustrated, and color.
MEASUREMENTS (mm) Holotype minor: HW 0.64, HL 0.76, SL 0.84, EL 0.14, PW 0.44
COLOR Body yellowish brown, appendages dark yellow.
RANGE Known only from the type locality.
BIOLOGY Pit trap, wet forest (A. Perez).

Compare with species listed
in the Diagnosis below

FIGURE Upper: major (syntype of synonymous *P. dimidiata* Emery). Lower: minor (syntype of synonymous *P. dimidiata* Emery). BOLIVIA: Salinas, Rio Beni, Bolivia; Luigi Balzan. (Type locality of *nigella*: also Salinas, Rio Beni, Bolivia; Luigi Balzan.) Scale bars = 1 mm.

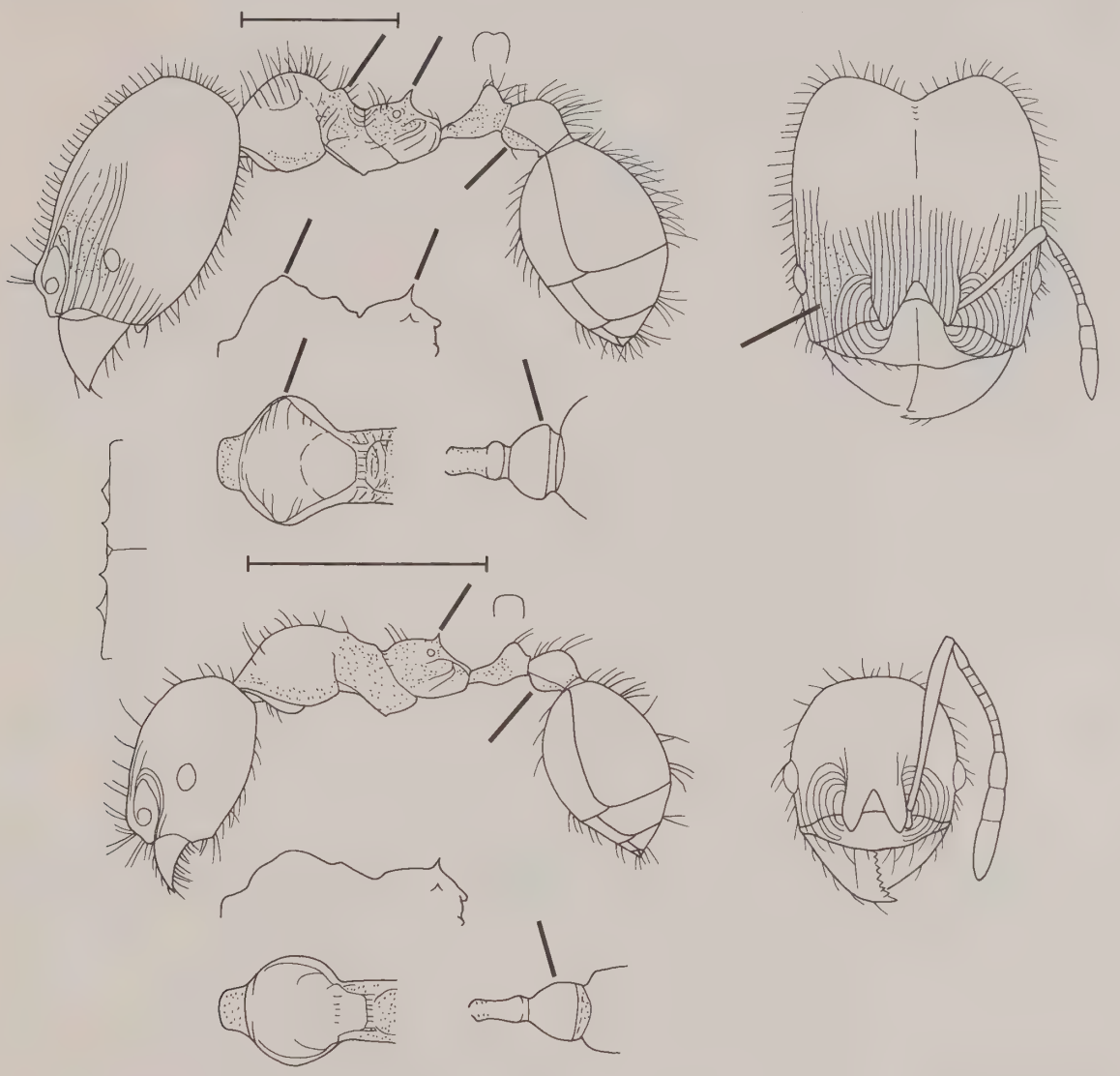


Pheidole nigella Emery, **new status**

Pheidole fabricator var. *nigella* Emery 1894d: 155. Syn.: *Pheidole dimidiata* Emery 1894d: 160, n. syn. Raised to species level in this monograph: *nitidicollis, schmalzi.*

TYPES Mus. Civ. Stor. Nat. Genova.
ETYMOLOGY L *nigella,* little dark one.
DIAGNOSIS A member of the *tristis* group similar to *balzani, fabricator,* and *tristis,* and distinguished from these and other species in the group by the following traits.
Major: small and dark; occiput with very broad, moderately deep median occipital concavity in full-face view; humerus in dorsal-oblique view a low, smooth convexity that runs almost indistinguishably into the mesothorax; mesothoracic convexity extremely reduced, barely visible; postpetiolar node oval; weak longitudinal carinulae cover sides of pronotum.
Minor: humerus with low blunt denticle in dorsal-oblique view; pronotum and mesonotum indistinguishable in a single profile; mesonotal convexity absent.
MEASUREMENTS (mm) Major (*nigella* lectotype): HW 1.06, HL 1.10, SL 0.60, EL 0.14, PW 0.50.
Minor: HW 0.54, HL 0.60, SL 0.54, EL 0.10, PW 0.38.
COLOR Major and minor: body concolorous medium brown, appendages brownish yellow.
RANGE Known from Bolivia and Peru.
BIOLOGY Unknown.

FIGURE Upper: holotype, major. Lower: paratype, minor. VENEZUELA: Rancho Grande, 1100 m (R. W. Poole). Scale bars = 1 mm.

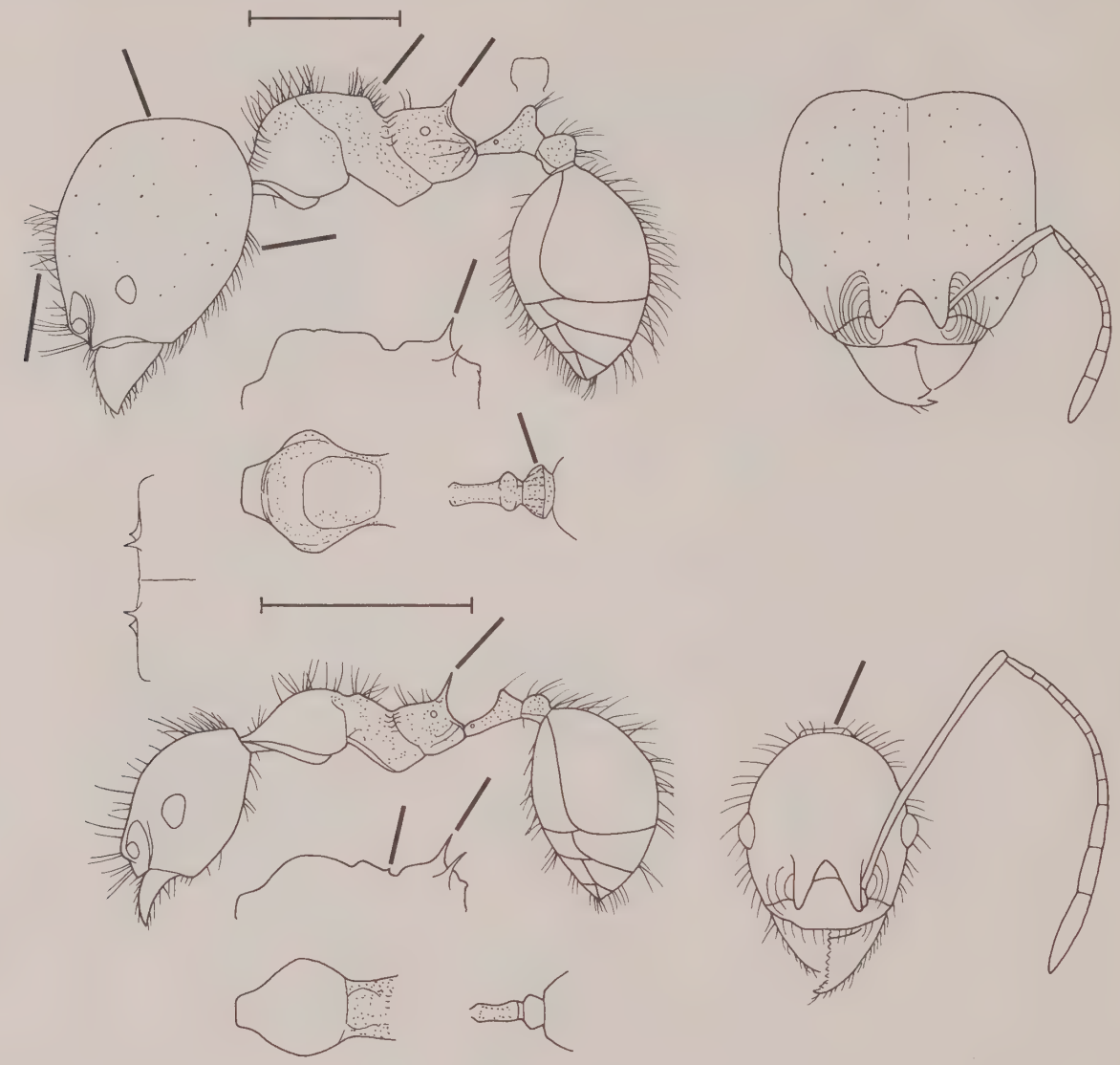


Pheidole obrima **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *obrima,* strong, mighty, alluding to large, robust bodies of both castes.
DIAGNOSIS A large, brown member of the *tristis* group with yellow appendages, relatively short propodeal spines, bell-shaped postpetiolar node, prominent convex subpostpetiolar process, and overall weak sculpturing comprising scattered patches of carinulae and foveolae. Similar to *alpinensis, excubitor, exarata, gaigei, germaini, godmani, grandinodus, grantae, rogeri, severini, stulta, tristis,* and *zoster,* differing in many details of body form, sculpturing, and pilosity, as illustrated, and in color.
MEASUREMENTS (mm) Holotype major: HW 1.68, HL 1.86, SL 0.84, EL 0.20, PW 0.82.
Paratype minor: HW 0.70, HL 0.74, SL 0.74, EL 0.12, PW 0.46.
COLOR Major: body medium reddish yellow, appendages reddish yellow.
Minor: head medium brown, rest of body yellowish brown, appendages light yellowish brown to dark yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *bulliceps, rotundiceps, sphaerica, subsphaerica*

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Finca Los Guaduales, 10 km southwest of San José del Palmar, Rio Torito, Chocó, 800 m (Charles Kugler). Scale bars = 1 mm.



Pheidole pepo **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *pepo,* melon, alluding to the unusual head shape of the major.

DIAGNOSIS A large, yellow member of the *tristis* group, similar to *rotundiceps, sphaerica,* and *subsphaerica,* easily distinguished by the following traits.

Major: head greatly swollen; clypeus and mandibles reduced proportionate to the head; outline of head in full-face view almost completely devoid of pilosity; in side view, profiles of both anterior dorsal half and anterior ventral half of head capsule densely pilose, but profiles of posterior dorsal and ventral halves bare of pilosity; propodeal spines long and acute.

Minor: body slender; occiput narrowed, with nuchal collar; propodeal spines long and slender, i.e., needle-like.

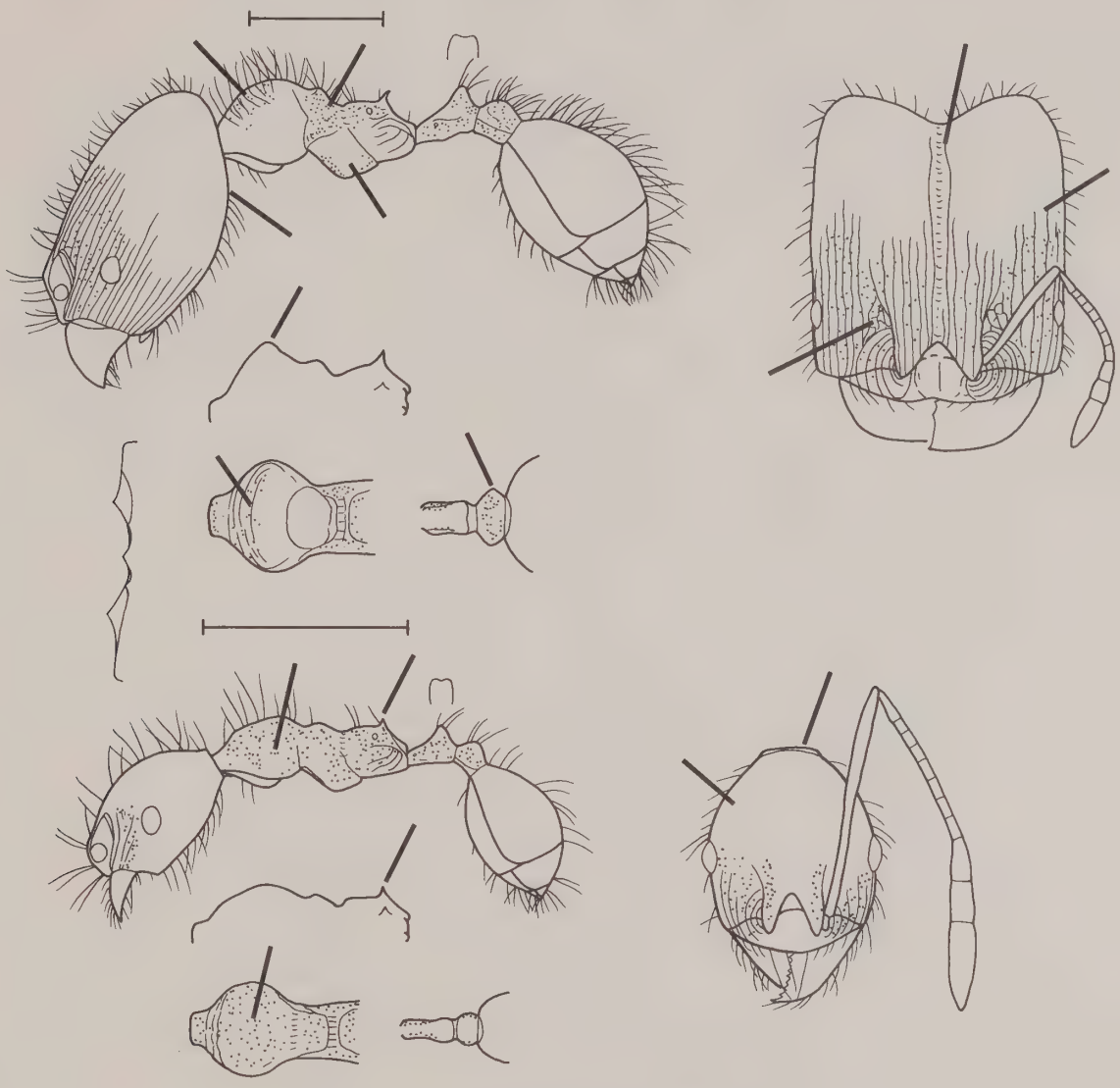
MEASUREMENTS (mm) Holotype major: HW 1.78, HL 1.66, SL 1.02, EL 0.22, PW 0.84.
Paratype minor: HW 0.64, HL 0.80, SL 1.06, EL 0.16, PW 0.44.

COLOR Major: head and appendages medium yellow; mesosoma, waist, and gaster yellowish brown.
Minor: concolorous dark yellow.

RANGE Known only from the type locality.

BIOLOGY Collected in spiny bamboo *(Guadua)* forest.

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Estácion Biologia de Cocha Cashu, Manu National Park, Madre de Dios, 400 m (Diane W. Davidson). Scale bars = 1 mm.

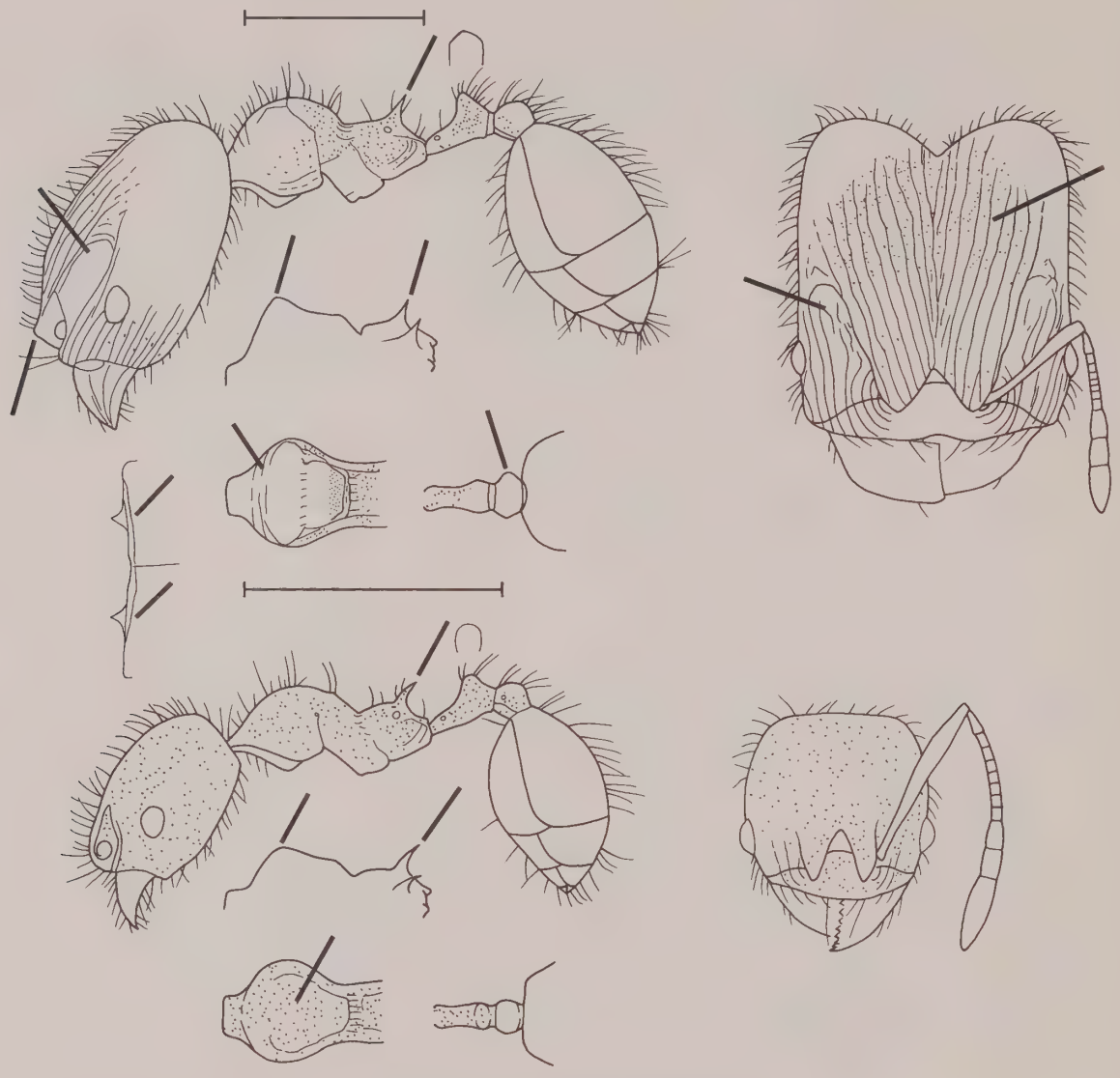


Pheidole peruviana **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the country of origin of the type colony.
DIAGNOSIS Similar in various traits to *amata, ambigua, celaena, fera, germaini, rutilana, schwarzmaieri, superba,* and *vomer,* differing as follows.
Major: reddish yellow; head in side view with strongly convex venter and weakly convex dorsum, tapering strongly toward occiput, and in full-face view subrectangular, somewhat elongate, with straight sides; small patch of rugoreticulum present just posterior to antennal fossa on each side; remainder of anterior half of head dorsum mostly carinulate, and posterior half smooth and shiny; humeri in dorsal-oblique view raised as prominent lobes; anterior third of pronotal dorsum carinulate and remainder of promesonotal dorsum smooth, as well as lower half of mesopleuron; postpetiole from above diamond-shaped.
Minor: occiput strongly narrowed, with nuchal collar; all of head posterior to eyes smooth; all of mesosoma foveolate; propodeal spines small and vertical on the propodeal basal face.
MEASUREMENTS (mm) Holotype major: HW 1.80, HL 2.10, SL 0.86, EL 0.22, PW 0.88.
Paratype minor: HW 0.60, HL 0.72, SL 0.86, EL 0.12, PW 0.42.
COLOR Major: concolorous reddish yellow.
Minor: concolorous plain medium yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *guayasana, rhytifera, rosae, rosula, securiger*

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Queremal, Rio San Juan, Valle, 1300 m (William L. Brown). Scale bars = 1 mm.



Pheidole pidax **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *pidax,* fountain, referring to the spray-like pattern of the cephalic carinulae.

DIAGNOSIS Sharing some traits with the species listed in the heading above, as well as others with some members of the *flavens* group, distinguished as follows.

Major: frontal lobes extended forward as blunt right-angular processes; shallow antennal scrobes present; propodeal spines half as long as basal propodeal face anterior to them; hypostoma 2-toothed; humerus in dorsal-oblique view very prominent, right-angular; carinulae originating on frontal lobes and seen in full-face view spread outward, away from the midline, for their entire length.

Minor: propodeal spines half as long as basal propodeal face and curved strongly backward; all of head, mesosoma, and petiole foveolate and opaque.

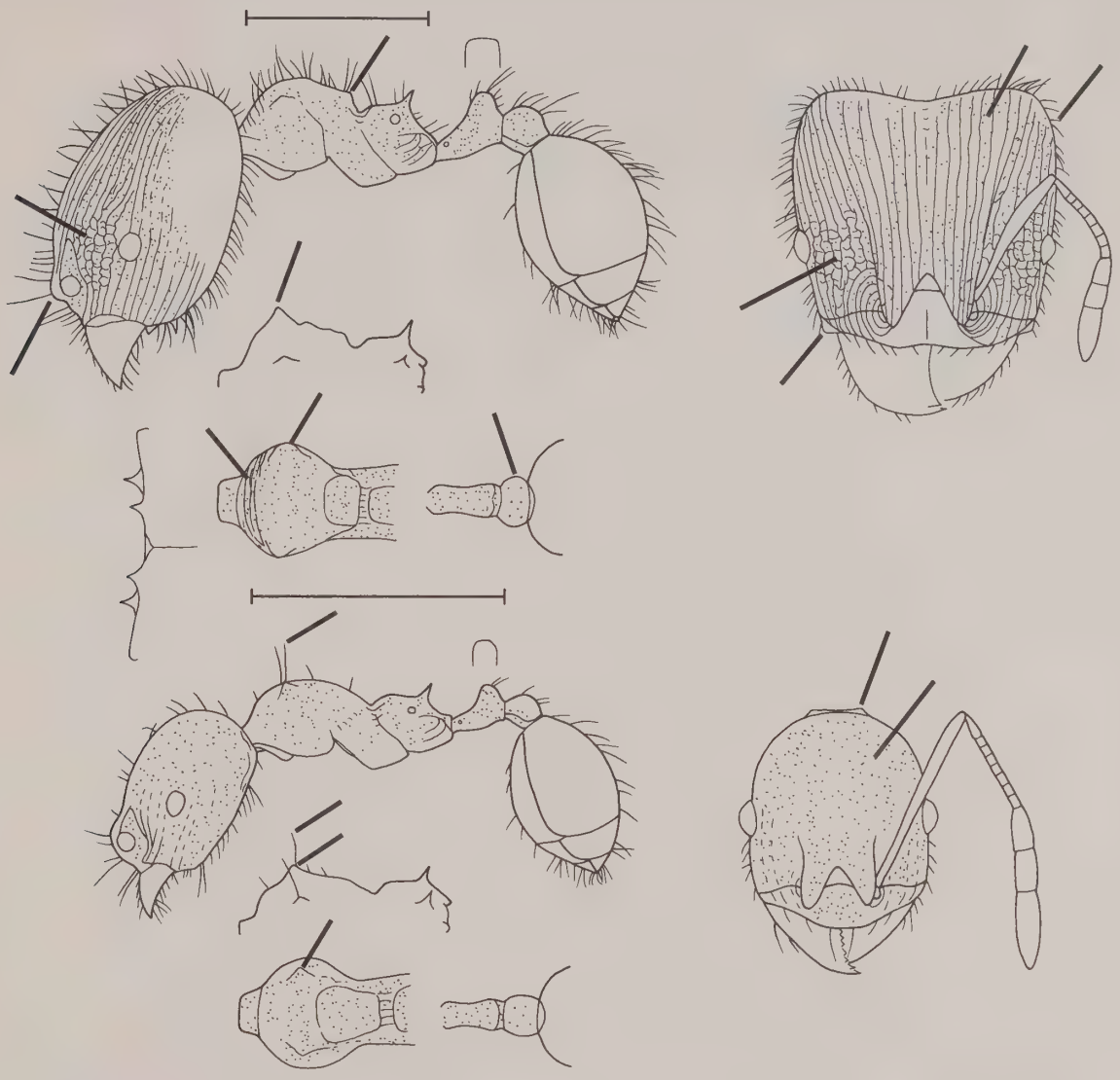
MEASUREMENTS (mm) Holotype major: HW 1.24, HL 1.56, SL 0.62, EL 0.22, PW 0.64.
Paratype minor: HW 0.56, HL 0.60, SL 0.62, EL 0.12, PW 0.38.

COLOR Major: body brownish yellow, appendages plain medium yellow.
Minor: concolorous medium yellow.

RANGE Known only from the type locality.

BIOLOGY The type colony was collected in montane rainforest. Winged queens were present on 28 July.

FIGURE Upper: holotype, major. Lower: paratype, minor. PANAMA: Nusagandi, San Blas (Leeanne Tennant-Alonso). Scale bars = 1 mm.

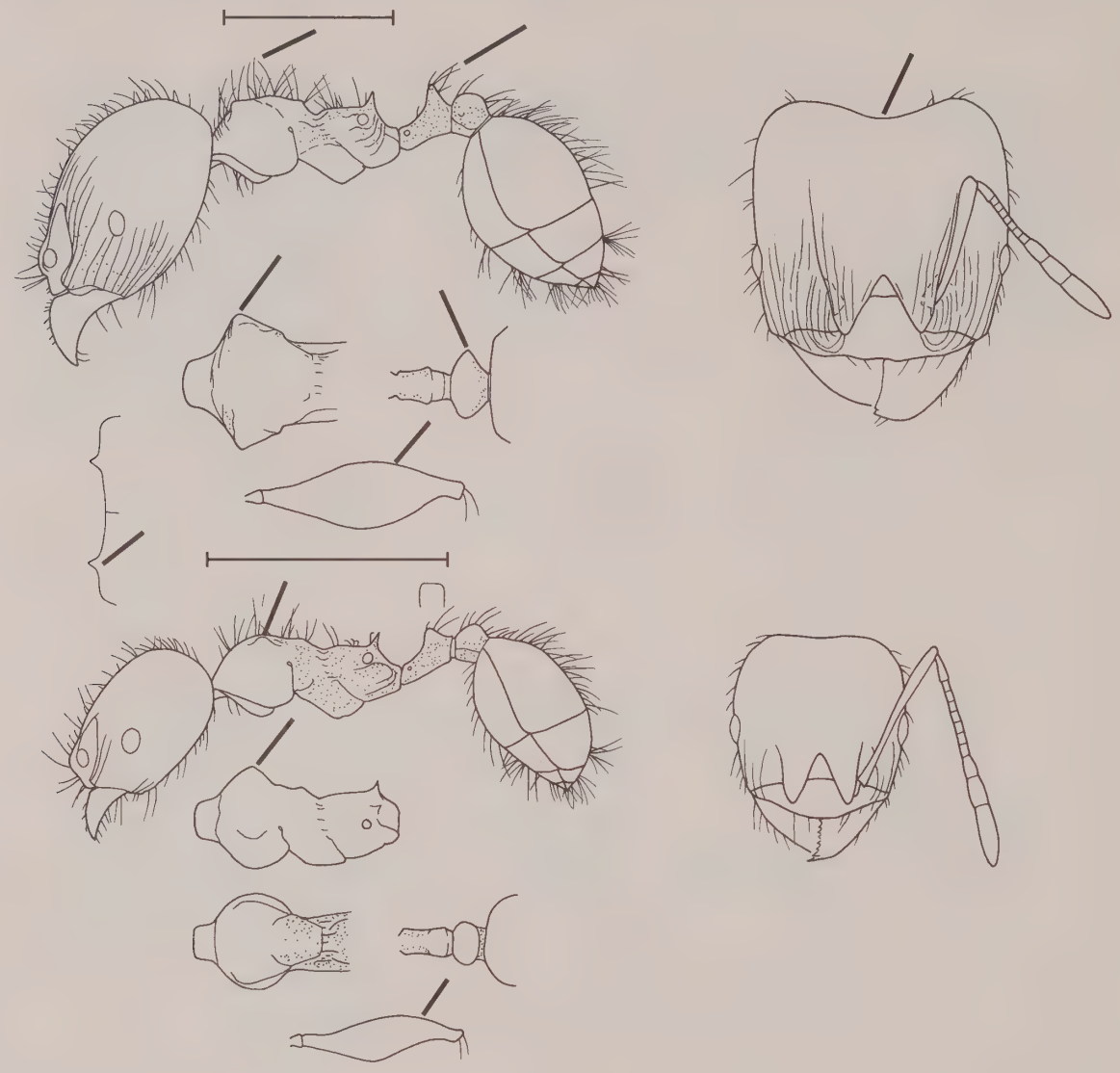


Pheidole pilispina **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *pilispina,* hairy spine, alluding to the long setae on apices of humeri in minor caste.
DIAGNOSIS Similar to *pidax* of Colombia, distinguished from it and other *Pheidole* as follows.
Major: yellow; humerus very prominent, in dorsal-oblique view extending from rest of promesonotal profile as a large equilateral triangle; in full-face view occiput much broader than clypeus, and occipital cleft shallow, giving entire head a wedge shape; rugoreticulum extensive from eye to antennal fossa posterior to frontal carina on each side of head; rest of dorsal surface of head carinulate, except for frontal triangle and midclypeus; all of mesosoma and waist foveolate; lateral corners of genae in full-face view right-angulate; postpetiole from above oval.
Minor: humeri bluntly spinose, with a long seta emerging form the apex of each; occiput narrow and with a nuchal collar; all of head, mesosoma, and waist foveolate to varying degree; pilosity sparse.
MEASUREMENTS (mm) Holotype major: HW 1.06, HL 1.12, SL 0.60, EL 0.12, PW 0.54.
Paratype minor: HW 0.56, HL 0.60, SL 0.64, EL 0.10, PW 0.40.
COLOR Major and minor: concolorous medium yellow.
RANGE Known from the type locality and Barro Colorado Island, Panama.
BIOLOGY Unknown.

Compare with *balzani, fabricator, nigella, tristis*

FIGURE Upper: major (syntype of synonymous *wheeleri*). Lower: minor (syntype of synonymous *wheeleri*). Hind tibia shown in both castes. (Type locality: Rio Beni, Bolivia, Luigi Balzan.) Scale bars = 1 mm.



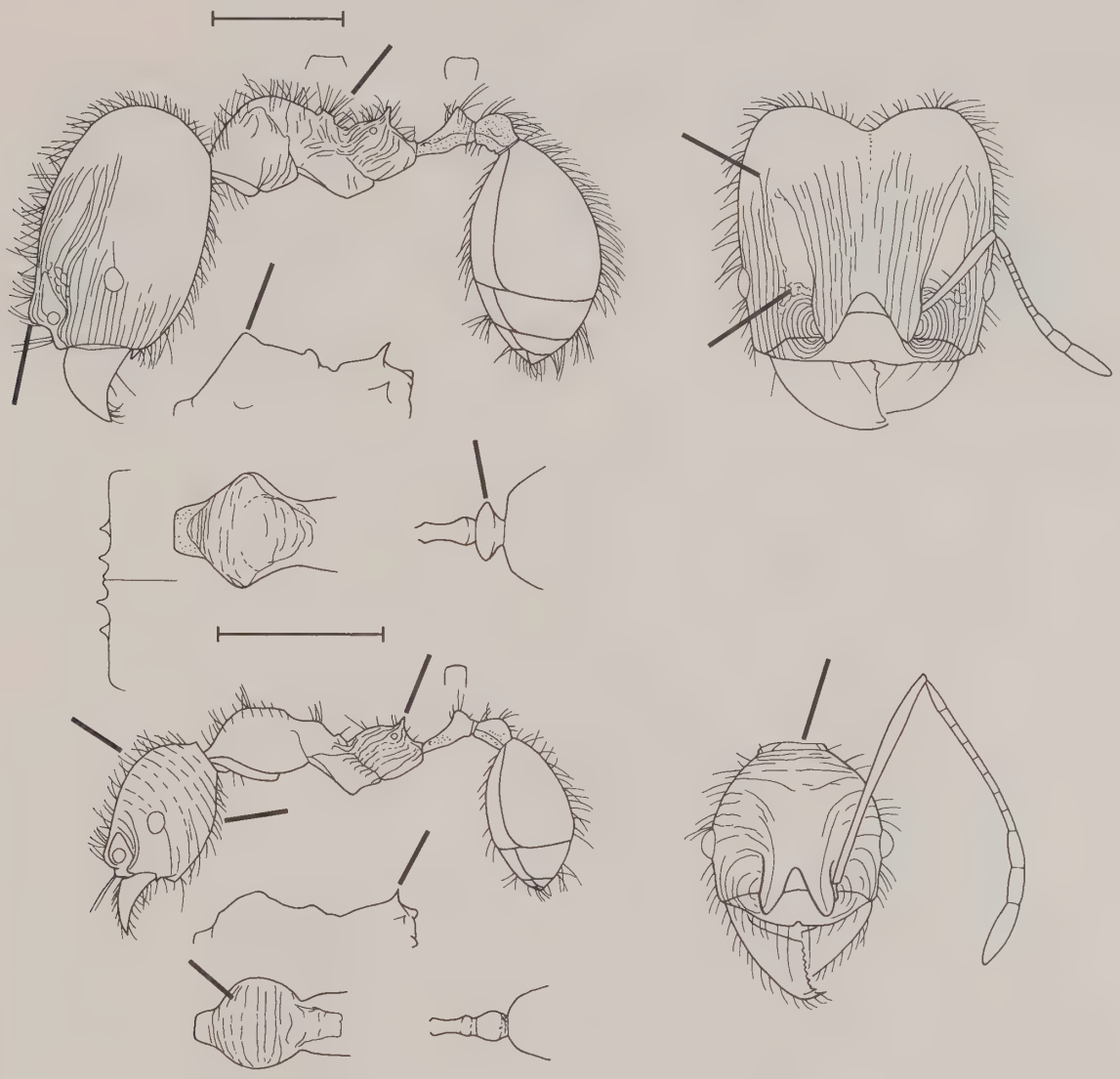
Pheidole polita Emery, **new status**

Pheidole fabricator var. *polita* Emery 1894d: 155. Synonymy: *Pheidole wheeleri* Mann 1916: 431, n. syn.

TYPES Mus. Civ. Stor. Nat. Genova.
ETYMOLOGY L *polita,* smooth, polished.
DIAGNOSIS A shiny, reddish or brownish yellow member of the *tristis* group, somewhat similar to *balzani, fabricator, nigella,* and *tristis* but immediately distinguishable from these and other species in the group by the following traits.
Major and **minor**: body mostly smooth and shiny, reddish brown; humeri very prominently angulate, in **major** seen from above extending well beyond the lower sides of the pronotum; hind tibiae greatly swollen.
Major: occipital border in full-face view very broadly and moderately concave.
MEASUREMENTS (mm) Major (*polita* lectotype): HW 1.20, HL 1.20, SL 0.62, EL 0.12, PW 0.62.
Minor (*polita* paralectotype): HW 0.64, HL 0.66, SL 0.60, EL 0.08, PW 0.40.
COLOR Major (*polita* lectotype): body brownish yellow, appendages dark yellow (*wheeleri* types are medium to light reddish brown, appendages a lighter shade of reddish brown).
Minor: concolorous yellowish brown (*wheeleri* types have body medium reddish brown, appendages yellowish to reddish brown.
RANGE Rio Beni, Bolivia (*polita* types); Rio Madeira, Rondônia, Brazil (*wheeleri* types); and Cuzco Amazónico, near Puerto Maldonado, Madre de Dios, Peru.
BIOLOGY At Cuzco Amazónico, Peru, Stefan Cover and John E. Tobin found a dense population of this species in a large clearing filled with logging detritus.

Compare with species listed in the Diagnosis below, especially *guilelmimuelleri*

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: Boraceia Biological Station, Mun. Salesópolis, São Paulo, 850 m (W. L. Brown). Scale bars = 1 mm.



Pheidole praeses **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *praeses,* guard, protector.

DIAGNOSIS Similar to *guilelmimuelleri* (see also *antillana, bucculenta, heyeri, hortonae, rhytifera*; and *mamore* in the *scrobifera* group), differing in the following combination of traits.

Major: very large, humerus very prominent and subangulate in dorsal-oblique view; mesonotal convexity flattened, its anterior edge subangulate; very shallow antennal scrobes present; a tiny patch of rugoreticulum exists laterad to each antennal fossa.

Minor: occiput narrowed, with nuchal collar; transverse carinulae circling most of the posterior half of the head capsule and covering all of the pronotal dorsum; posterior half of mesopleuron and sides of propodeum longitudinally carinulate.

MEASUREMENTS (mm) Holotype major: HW 2.28, HL 2.34, SL 1.08, EL 0.24, PW 1.02.
Paratype minor: HW 0.82, HL 0.92, SL 1.12, EL 0.16, PW 0.56.

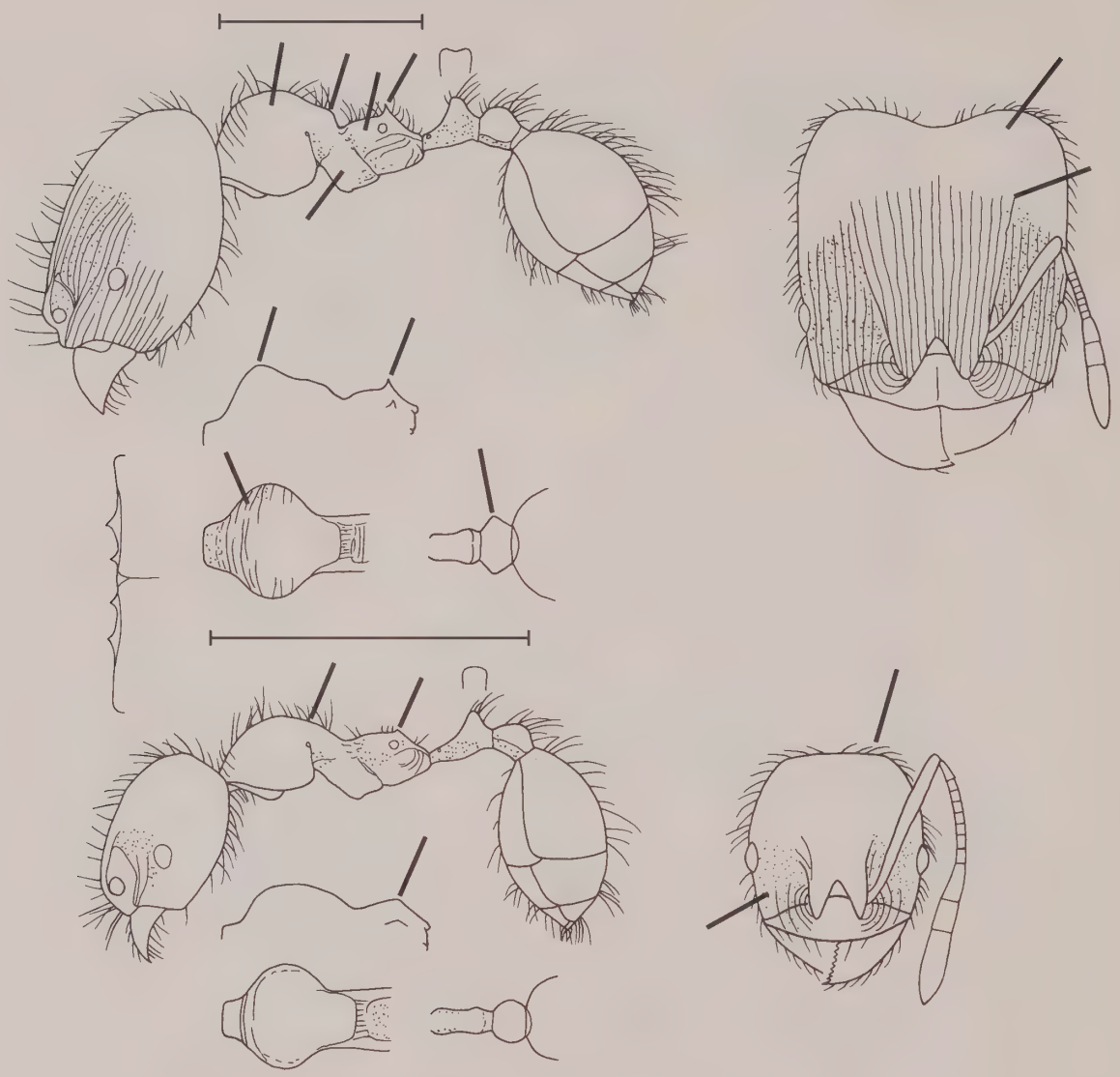
COLOR Major: overall reddish yellow; anterior fourth of head and mandibles increasingly dark in an anterior direction, so that the mandibles are light reddish brown.
Minor: concolorous dark yellow.

RANGE Known from the type locality and Santa Tereza, Espírito Santo, 700 m, Brazil.

BIOLOGY The species occurs in montane rainforest. The Boraceia Biological Station series contains an ordinary queen, but that from Santa Tereza is accompanied by a large ergatogyne.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (Leeanne Tennant-Alonso). Scale bars = 1 mm.



Pheidole prattorum **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named in honor of Joe D. Pratt, ardent and effective supporter of biodiversity studies, and his family.

DIAGNOSIS Similar in various traits to *balzani, brunnescens, exarata, excubitor, fabricator, germaini, hispaniolae, nigella, sabina, sarpedon, tristis, tristops,* and *unicornis,* distinguished as follows.

Major: reddish yellow; posterior third of head dorsum mostly smooth; carinulae cover most of anterior two-thirds of head dorsum, their posterior ends aligned in an even semicircle transversely across the head; in dorsal-oblique view, humerus raised slightly as a broad lobe; mesonotal convexity almost completely suppressed; short, thin propodeal spines vertical on propodeal basal face, in side view tilted slightly forward; postpetiole from above diamond-shaped; anterior and lateral margins of pronotal dorsum carinulate, and almost all the rest of mesosoma smooth and shiny.

Minor: head and body almost completely smooth and shiny; occiput broad, lacking a nuchal collar; propodeal spine reduced to denticle, or absent.

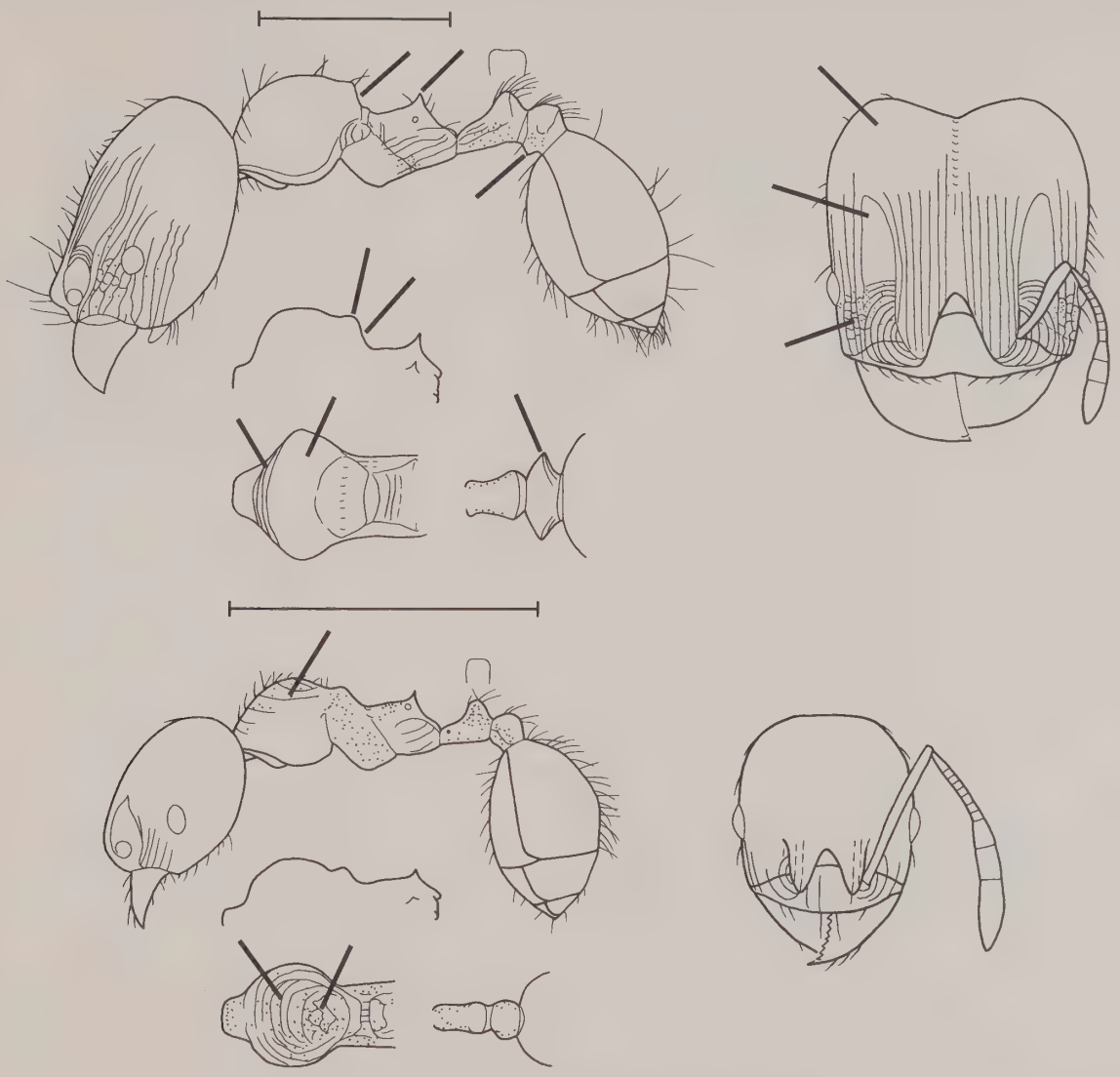
MEASUREMENTS (mm) Holotype major: HW 1.22, HL 1.34, SL 0.60, EL 0.14, PW 0.64.
Paratype minor: HW 0.54, HL 0.56, SL 0.54, EL 0.06, PW 0.34.

COLOR Major: concolorous reddish yellow.
Minor: concolorous plain medium yellow.

RANGE Known only from the type colony and three others collected by John T. Longino (1997) and Leeanne Tennant at the La Selva Biological Station in northeastern Costa Rica.

BIOLOGY One of the colonies of *prattorum* was found by Longino in mature lowland rainforest beneath an epiphyte mat in an old treefall.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ARGENTINA: Buenos Aires. Scale bars = 1 mm.



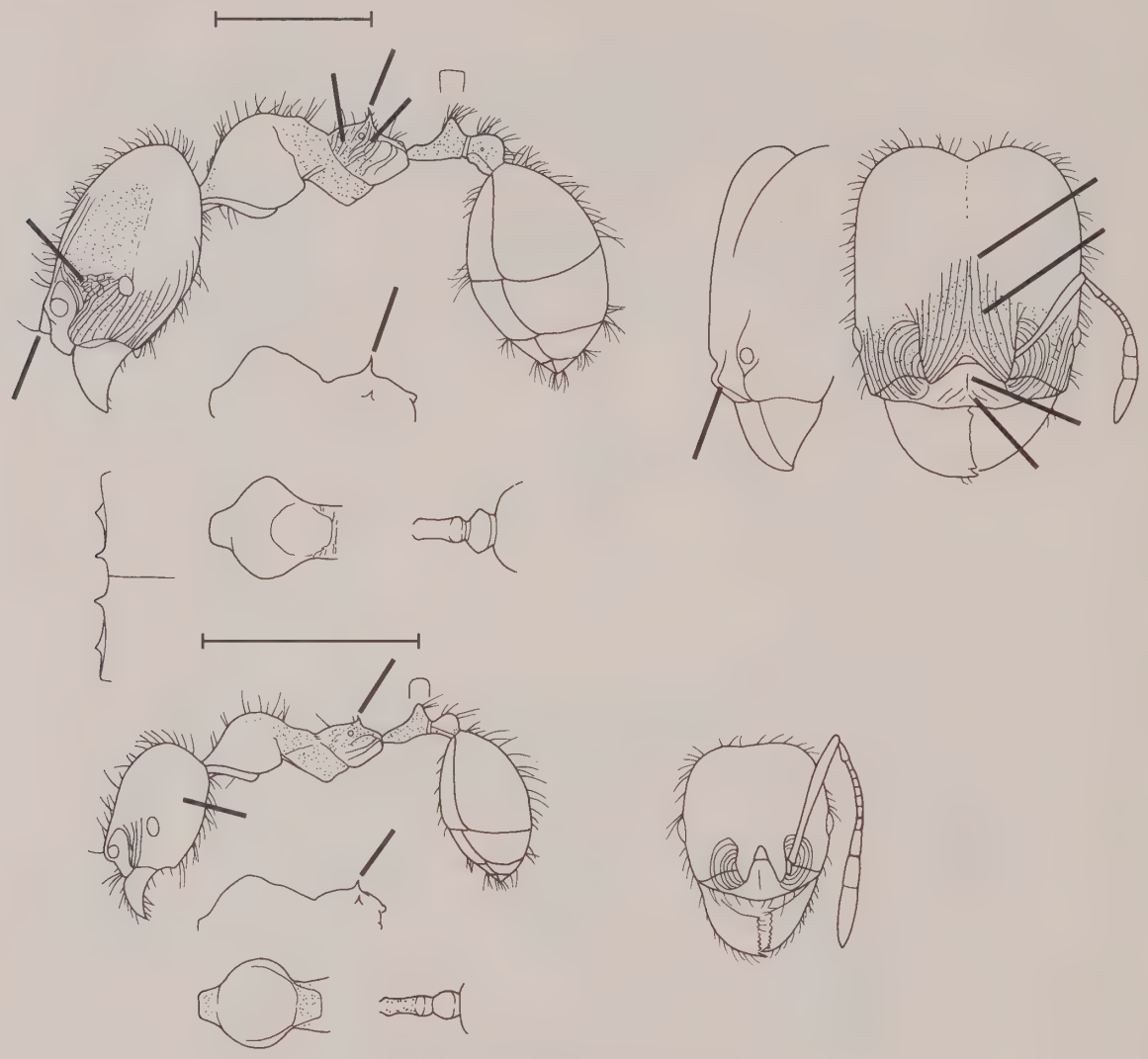
Pheidole pullula Santschi, **new status**

Pheidole silvestrii var. *pullula* Santschi 1911b: 53.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY L *pullula,* small dark one, allusion uncertain.
DIAGNOSIS Similar to *bellatrix, bison,* and *napoensis,* differing from them and other *tristis*-group members as follows.
Major: promesonotum large, descending to the metanotum through a nearly vertical face half as long as the basal face of the propodeum; antennal scrobe present; posterior third of dorsal head surface smooth; postpetiole from above cornulate; rugoreticulum present between eye and antennal fossa; strong, convex postpetiolar process present; anterior rim of pronotal dorsum carinulate, rest of promesonotum smooth and shiny.
Minor: semicircular carinulae cover promesonotum except for center, which is rugoreticulate.
MEASUREMENTS (mm) Lectotype major: HW 1.30, HL 1.54, SL 0.62, EL 0.16, PW 0.82.
Paralectotype minor: HW 0.52, HL 0.56, SL 0.40, EL 0.08, PW 0.32.
COLOR Major: body and mandibles medium reddish brown, other appendages reddish yellow.
Minor: gaster light brown, rest of body light yellowish brown, appendages yellow.
RANGE Recorded from Buenos Aires and Córdoba, Argentina.
BIOLOGY Unknown.

Compare with *binasifer, diabolus, gravida, mirabilis, moseni, mosenopsis, nasifer, unicornis*

FIGURE Upper: major (side view, El Volcan Chiriqui, Panama, 900 m; full-face view, Cerro Campana, Panama, 800–950 m); compared with lectotype major. Lower: minor (Cerro Campana, Panama); compared with paralectotype. (Type locality: Bugaba, Panama.) Scale bars = 1 mm.

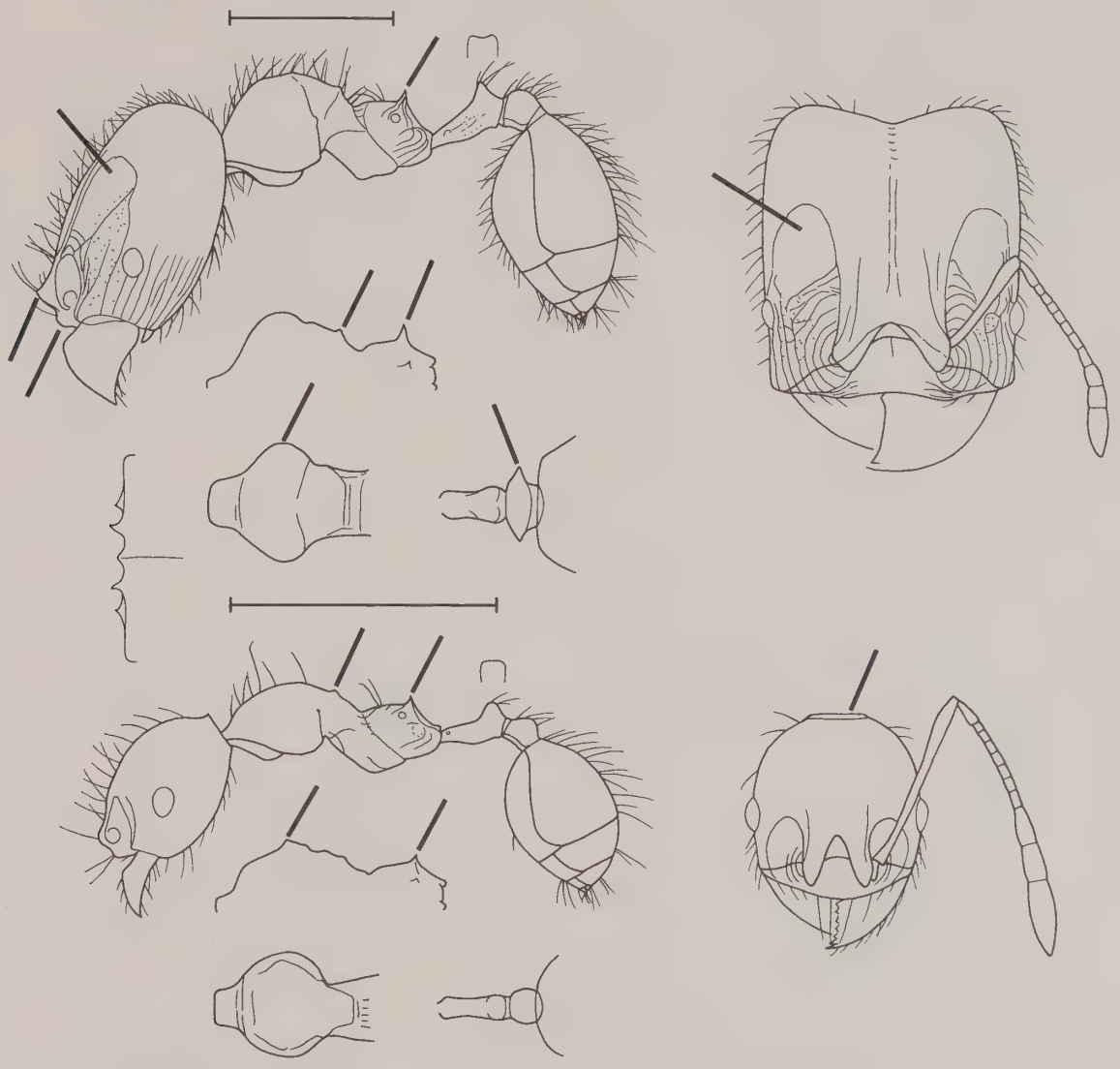


Pheidole rhinoceros Forel

Pheidole rhinoceros Forel 1899e: 73.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY Species name inspired by the hornlike extension of the midclypeus.
DIAGNOSIS Similar in various ways to the species listed in the heading above, differing as follows.
Major: middle carina of clypeus raised into a right-angular hornlike protrusion, from which radiate carinulae traveling obliquely downward toward the anterior clypeal border; carinae originating on borders of frontal lobe curve inward toward the midline; posterior half of dorsal surface and all of pronotum smooth and shiny; propodeal spines slender, and vertical on the propodeal basal face.
Minor: propodeal spines short, slender, and vertical on the propodeal basal face; head entirely smooth. Longino (1997) notes that considerable variation exist in the sculpturing of the minors in at least Honduras and Costa Rica. At elevations of about 500 m or higher, minors tend to have more extensive foveolation on the pronotum and mesopleuron than do minors at lower elevations. In Costa Rica at least, the two forms are nowhere sympatric but in Braulio Carrillo National Park approach within 300 m elevation and about 5 km distance. The two forms may represent distinct species, but Longino treats them as conspecifics, and this more conservative arrangement appears appropriate for the time being.
MEASUREMENTS (mm) Lectotype major: HW 1.26, HL 1.40, SL 0.60, EL 0.16, PW 0.70.
Paralectotype minor: HW 0.60, HL 0.64, SL 0.58, EL 0.10, PW 0.38.
COLOR Major and minor: concolorous light to medium brown.
RANGE *P. rhinoceros* is at least locally common in upland forests to as high as 1100 m, from Honduras to Colombia.
BIOLOGY In Costa Rica Longino (1997) found the species nesting in pieces of dead wood on the ground and, in one instance, beneath the loose bark of a 1-meter-wide tree trunk in an old treefall. At Guanacaste Conservation Area, in montane rainforest, he observed workers tending homopterans under loose bark.

FIGURE Upper: holotype, major. Lower: paratype, minor. VENEZUELA: Rancho Grande, Parque Nacional Pittier, 1000–1200 m (J. D. Weintraub). Scale bars = 1 mm.

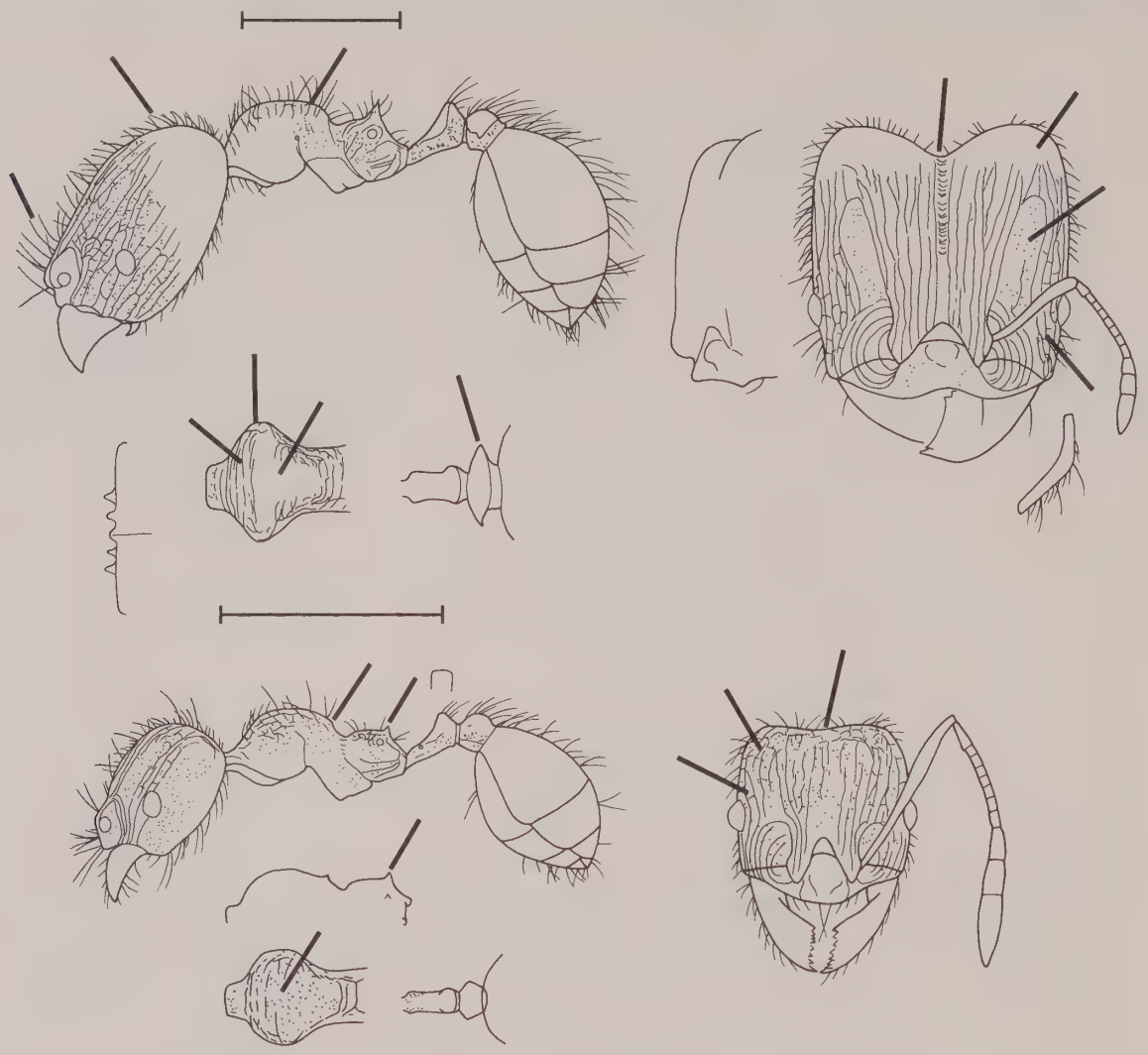


Pheidole rhytifera **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *rhytifera,* bearing a horn, referring to the profile of the frontal lobe.
DIAGNOSIS Similar to the species listed in the heading above, differing in the following combination of traits.
Major: shallow antennal scrobes present; frontal lobe in side view angulate and turning upward; postpetiole sharply cornulate; posterior half of head and all the rest of the body smooth and shiny.
Minor: occiput narrowed, with nuchal collar; humerus with tooth in dorsal-oblique view; propodeal spine reduced and erect; entire body and head smooth and shiny.
MEASUREMENTS (mm) Holotype major: HW 1.34, HL 1.44, SL 0.60, EL 0.10, PW 0.76.
Paratype minor: HW 0.58, HL 0.60, SL 0.66, EL 0.12, PW 0.36.
COLOR Major and minor: light brown.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with species listed
in the Diagnosis below

FIGURE Upper: syntype, major. Lower: syntype, minor. ARGENTINA: Buenos Aires (Fr. Ris). Scale bars = 1 mm.

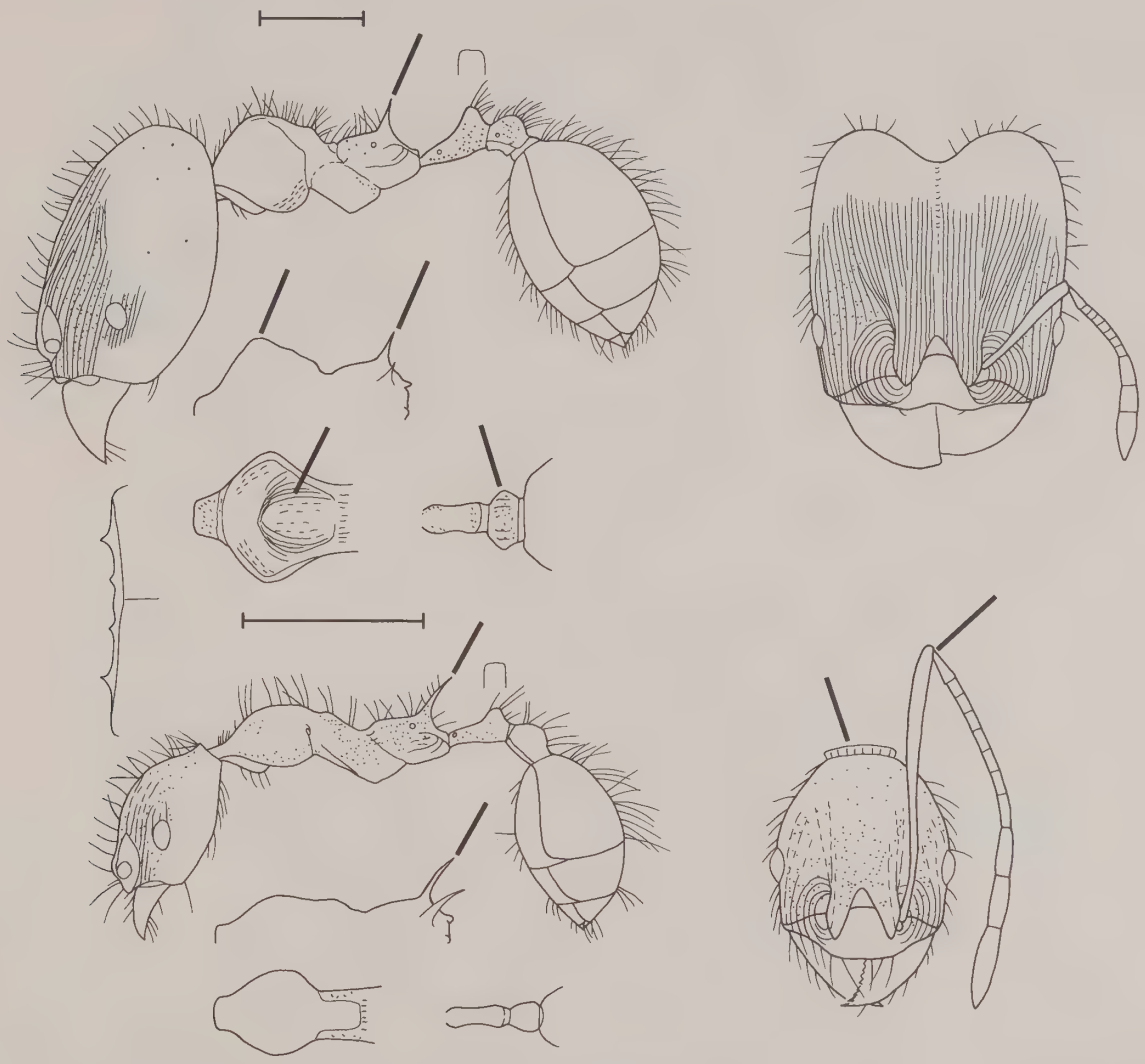


Pheidole risii Forel

Pheidole risii Forel 1892a: 38. Raised to species level in this monograph: *rugatula, trachyderma.*

TYPES Mus. Hist. Nat. Genève; Mus. Comp. Zool. Harvard.
ETYMOLOGY Named after the collector, Fr. Ris.
DIAGNOSIS Similar in various traits to *aper, bambusarum, brevicona, dyctiota, laeviventris, lutzi, rugatula, senilis, sigillata, trachyderma,* and *traini,* differing as follows.
Major: shallow antennal scrobes; pilosity along dorsal profile of head dense, with uniform short hairs about as long as Eye Length along the posterior half and much longer hairs along the anterior half; occipital cleft deep; occipital lobes smooth and subangulate; pronotum sparsely carinulate, mostly smooth; propodeal spine very stout, equilaterally triangular; postpetiolar node very broad, 2× broader than petiolar node, and spinose.
Minor: occiput, humeri, and propodeal dorsum rugoreticulate; almost all of head and mesosoma foveolate; occiput broad, concave, and lacking nuchal collar.
MEASUREMENTS (mm) Syntype major: HW 0.96, HL 1.02, SL 0.44, EL 0.12, PW 0.54.
Syntype minor: HW 0.66, HL 0.66, SL 0.62, EL 0.12, PW 0.44.
COLOR Major: body reddish yellow except for gaster, which is yellowish brown.
Minor: concolorous dark yellow.
RANGE In addition to the type locality, *risii* has been recorded from São Paulo, Brazil (Kempf 1972b).
BIOLOGY Unknown.

FIGURE Upper: major (compared with unique holotype major in Mus. Civ. Stor. Nat. Genova). Lower: minor. COSTA RICA: La Selva Biological Station, near Puerto Viejo, Heredia (D. Roth). (Type locality: "Jiménez," near Guápiles, Costa Rica.) Scale bars = 1 mm.



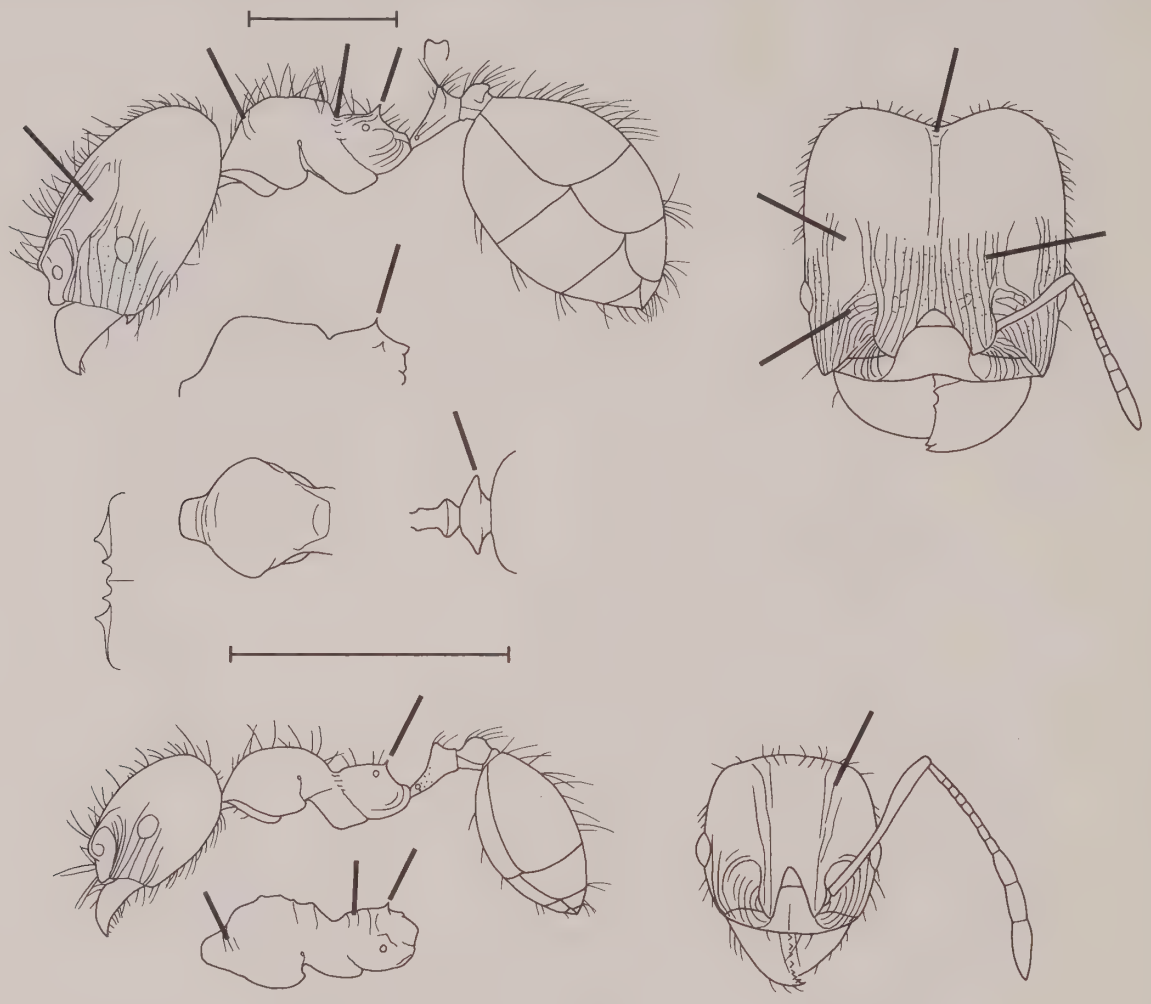
Pheidole rogeri Emery

Pheidole rogeri Emery 1896g: 64.

TYPES Mus. Civ. Stor. Nat. Genova.
ETYMOLOGY Eponymous.
DIAGNOSIS A very large species with "brick red" (clear light reddish brown) **majors** and brownish yellow **minors**.
Major and **minor** with extremely long propodeal spines.
Major: all of anterior dorsal three-fourths of head covered by densely packed parallel longitudinal carinae; mesonotal convexity low, subangulate in side view; anterior margin of postpetiolar surface projecting as a small toothlike process in side view.
Similar to *alpinensis, exarata, excubitor, germaini, grantae, grandinodus, obrima, stulta, tristis,* and *zoster,* differing in many details of body form, sculpturing, and pilosity, as illustrated, and in color.
MEASUREMENTS (mm) Unique holotype major: HW 2.40, HL 2.64, SL 1.06, EL 0.24, PW 1.12.
Minor (La Selva Biological Station, Costa Rica): HW 0.68, HL 0.84, SL 1.04, EL 0.14, PW 0.46.
COLOR Major: the holotype is a rich concolorous light reddish brown ("brick red"), with a yellowish tinge. Majors in the La Selva Biological Station series have the brick red color in the head, mesosoma, and waist, but the gaster is plain medium brown, and the propodeal spines are blackish brown; and in addition, faint iridescent blue reflections can be seen on the dorsal surface of the body in certain angles of light.
Minor: brownish yellow overall.
RANGE Atlantic slope of Costa Rica to 800 m (J. T. Longino 1997).
BIOLOGY Nests in soil in wet forests; the colonies are difficult to locate during excavation even when the nests are opened carefully (Longino 1997).

Compare with *guayasana, pidax, rosula, securiger*

FIGURE Upper: syntype, major of synonymous *P. silvestrii* Emery (Santa Catarina, Brazil). Lower: syntype, minor of synonymous *P. silvestrii* Emery (Quebrada Cainzo, Tucumán, Argentina). Scale bars = 1 mm.

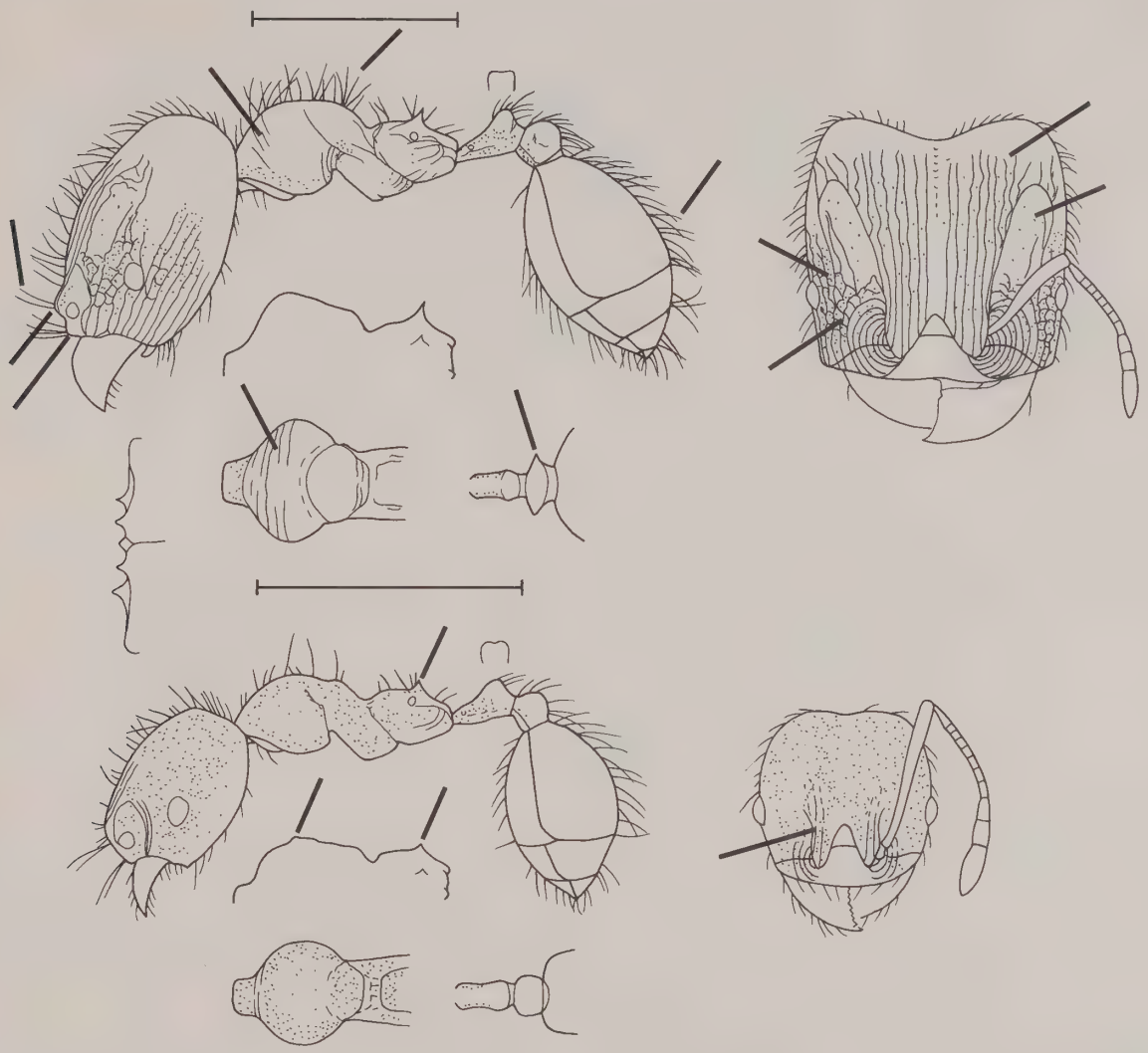


Pheidole rosae Forel

Pheidole rosae Forel 1901m: 63, replacement name for *gertrudae* Mayr 1887: 592, primary junior homonym of *gertrudae* Forel 1886b: xlii. Syn.: *Pheidole silvestrii* Emery 1906c: 146, n. syn. Raised to species level in this monograph: *pullula*.

TYPES Naturhist. Mus. Wien.
ETYMOLOGY Eponymous.
DIAGNOSIS Similar in various characters to species listed above, distinguished as follows.
Major: reddish yellow; frontal lobes extended forward as conspicuous lobes, as seen in side view; wide, shallow antennal scrobe present; promesonotum descends abruptly and obliquely to metanotum; postpetiolar node spinose; portions of anterior pronotal dorsum and propodeal dorsum carinulate, and rest of mesosoma smooth and shiny.
Minor: several carinulae extend from frontal lobes to occiput, center of occiput carinulate, and rest of posterior dorsal head surface smooth; propodeal spines reduced to denticles.
MEASUREMENTS (mm) Syntype major of synonymous *silvestrii*: HW 1.40, HL 1.52, SL 0.60, EL 0.16, PW 0.72.
Syntype minor of synonymous *silvestrii*: HW 0.62, HL 0.64, SL 0.58, EL 0.12, PW 0.42.
COLOR Major: concolorous reddish yellow.
Minor: concolorous plain medium yellow.
RANGE Recorded from Santa Catarina (type locality) and, as the synonymous *"silvestrii,"* from Tucumán (type locality), Buenos Aires, and Córdoba, Argentina (Kempf 1972b; W. L. Brown).
BIOLOGY An inhabitant of subtropical forests. Winged queens and males were present in a nest near Tapia, Tucumán, on 25 January (W. L. Brown).

FIGURE Upper: holotype, major. Lower: paratype, minor. ARGENTINA: Palermo, Buenos Aires (R. Thaxter). Scale bars = 1 mm.

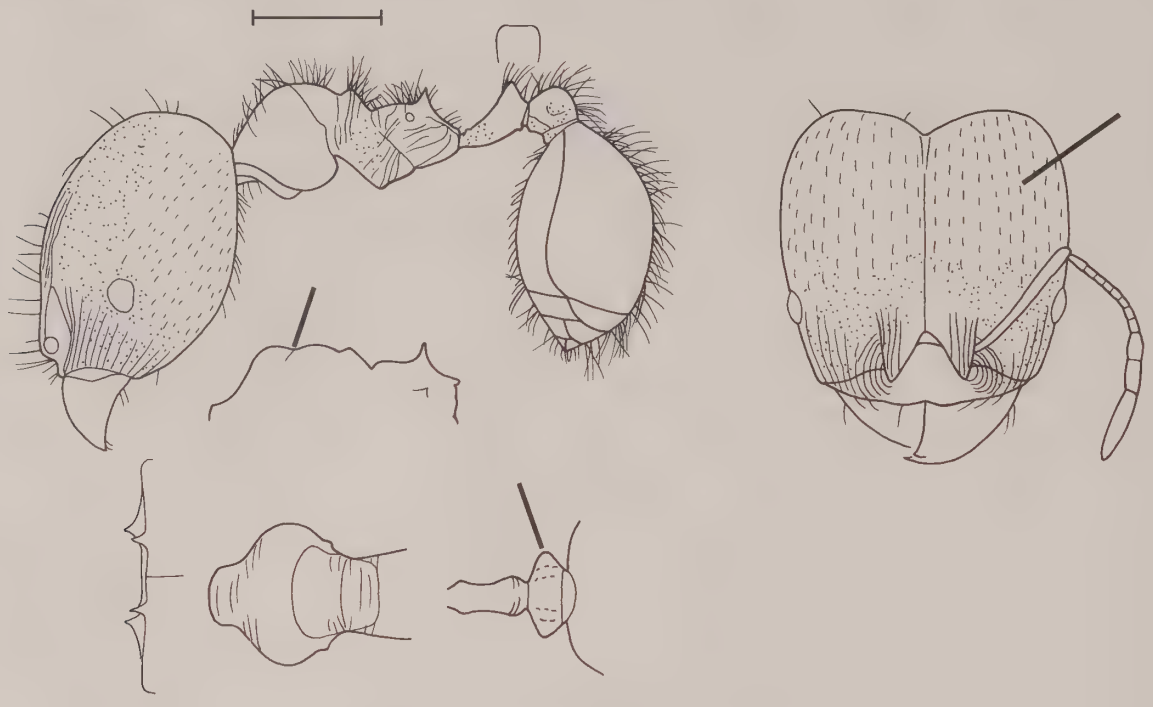


Pheidole rosula **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *rosula,* little rose, alluding to similarity with *P. rosae.*
DIAGNOSIS Similar in various characters to species listed in heading above, especially *rosae,* and distinguished as follows.
Major: reddish yellow; frontal lobes extended forward as low but still conspicuous lobes, in side view; shallow antennal scrobes present, with surfaces smooth except for scattered foveae; postpetiole spinose; rugoreticulum on each side of head extends from eye to antennal fossa, posterior to eye for about an Eye Length distance, and anterior almost to the anterior genal border; carinulae extend to occiput, which is smooth; anterior half of pronotal dorsum carinulate; pilosity dense and long, with some hairs longer than Eye Length.
Minor: most of head and mesosoma variably foveolate; frontal lobes carinulate; humerus in dorsal-oblique view denticulate; propodeal spines reduced to denticles.
MEASUREMENTS (mm) Holotype major: HW 1.22, HL 1.28, SL 0.54, EL 0.16, PW 0.72.
Paratype minor: HW 0.62, HL 0.64, SL 0.54, EL 0.12, PW 0.40.
COLOR Major: body and mandibles reddish yellow, appendages plain dark yellow.
Minor: concolorous light reddish yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with *pepo, sphaerica, subsphaerica*

FIGURE Holotype, major. ECUADOR: Tinalandia, 16 km southeast of Domingo de los Colorados (Stewart B. and Jarmila Kukalová-Peck). Scale bar = 1 mm.



Pheidole rotundiceps **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *rotundiceps,* round head.

DIAGNOSIS A very large, yellow member of the *tristis* group, similar to *pepo, sphaerica,* and *subsphaerica,* easily distinguished by the following traits.

Major: head capsule nearly circular in outline; the entire outline of the head in full-face view almost completely devoid of pilosity; entire head posterior to the level of the eye sparsely covered by rows of elongate foveae; postpetiolar node seen from above bluntly cone-shaped.

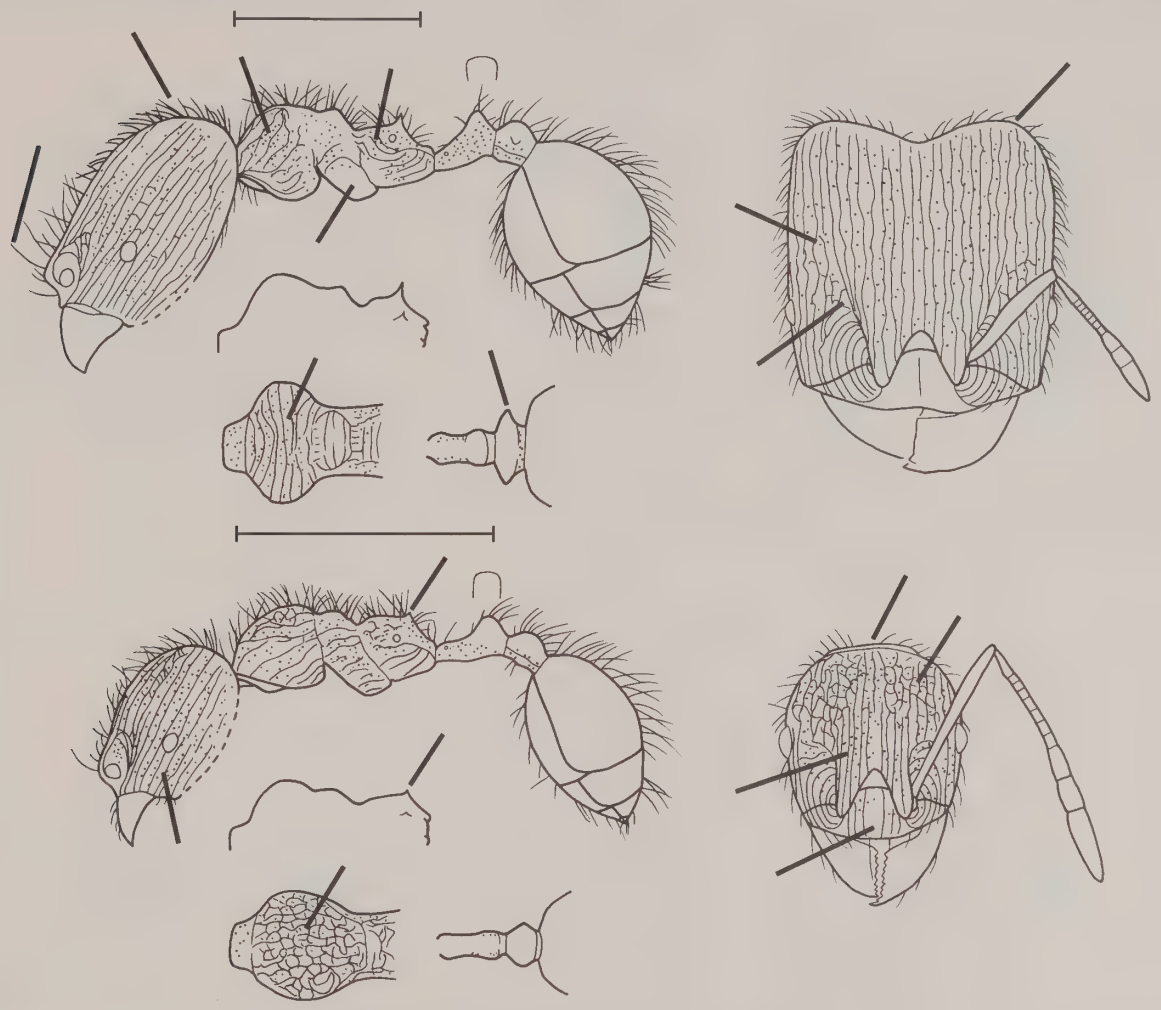
MEASUREMENTS (mm) Holotype major: HW 2.34, HL 2.24, SL 1.10, EL 0.30, PW 0.98.

COLOR Major: concolorous light reddish yellow (light "orange").

RANGE Known only from the type locality.

BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ARGENTINA: Loreto, Misiones. Scale bars = 1 mm.



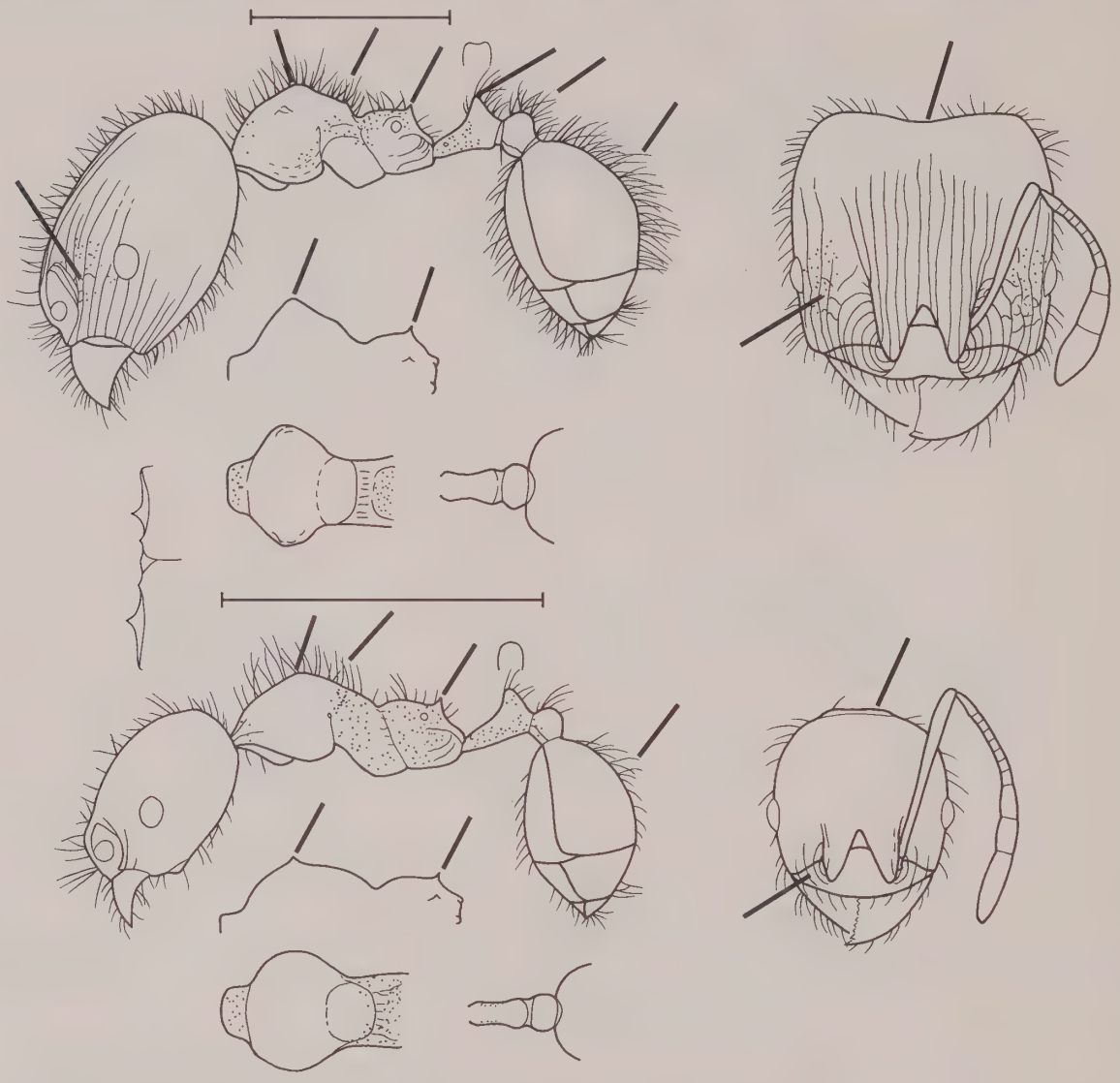
Pheidole rugatula Santschi, **new status**

Pheidole risi var. *rugatula* Santschi 1933f: 109.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY L *rugatula,* with little wrinkles (rugulae).
DIAGNOSIS Similar in various traits to *aper, bambusarum, brevicona, dyctiota, laeviventris, lutzi, risii, senilis, sigillata, trachyderma,* and *traini,* differing as follows.
Major: rugoreticulum confined to small patch posterior to antennal fossa on each side of head; entire rest of head carinulate except frontal triangle and mid-clypeus; all of dorsal surface of mesosoma transversely carinulate, and carinulae on pronotal dorsum curve down to pronotal sides as rugulae; hairs along posterior dorsal half of head profile of uniform short length, about half of Eye Length, and those along anterior dorsal half mostly 1.5–2.0× as long; postpetiole from above spinose.
Minor: posterior third of head and all of promesonotal dorsum rugoreticulate; propodeal spines reduced to denticles; occiput only slightly narrowed, but with nuchal collar.
MEASUREMENTS (mm) Lectotype major: HW 1.34, HL 1.38, SL 0.70, EL 0.14, PW 0.74.
Paralectotype minor: HW 0.64, HL 0.62, SL 0.60, EL 0.06, PW 0.40.
COLOR Major: body dark reddish brown, appendages dark yellow.
Minor: body plain medium brown, appendages brownish yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. BRAZIL: Taperinha, Pará (Robert L. Jeanne). Scale bars = 1 mm.



Pheidole rutilana **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *rutilana,* red, alluding to the color of the major.

DIAGNOSIS Similar in various traits to *amata, ambigua, celaena, fera, germaini, peruviana, schwarzmaieri, superba,* and *vomer,* differing as follows.

Major: yellowish red; head in full-face view quadrate, almost as wide as long and with shallow occipital cleft; humeri in dorsal-oblique view prominent, raised as large equilateral triangles; center of promesonotal profile in side view slightly raised as an obtuse angle; propodeal spines reduced to denticles; rugoreticulum present between eye and antennal fossa on each side of head; posterior fourth of dorsal head surface smooth.

Minor: occiput only slightly narrowed but possesses nuchal collar; humeri in dorsal-oblique view dentate; center of promesonotal profile in side view slightly raised as an obtuse angle; almost all of head as well as all of pronotum smooth and shiny.

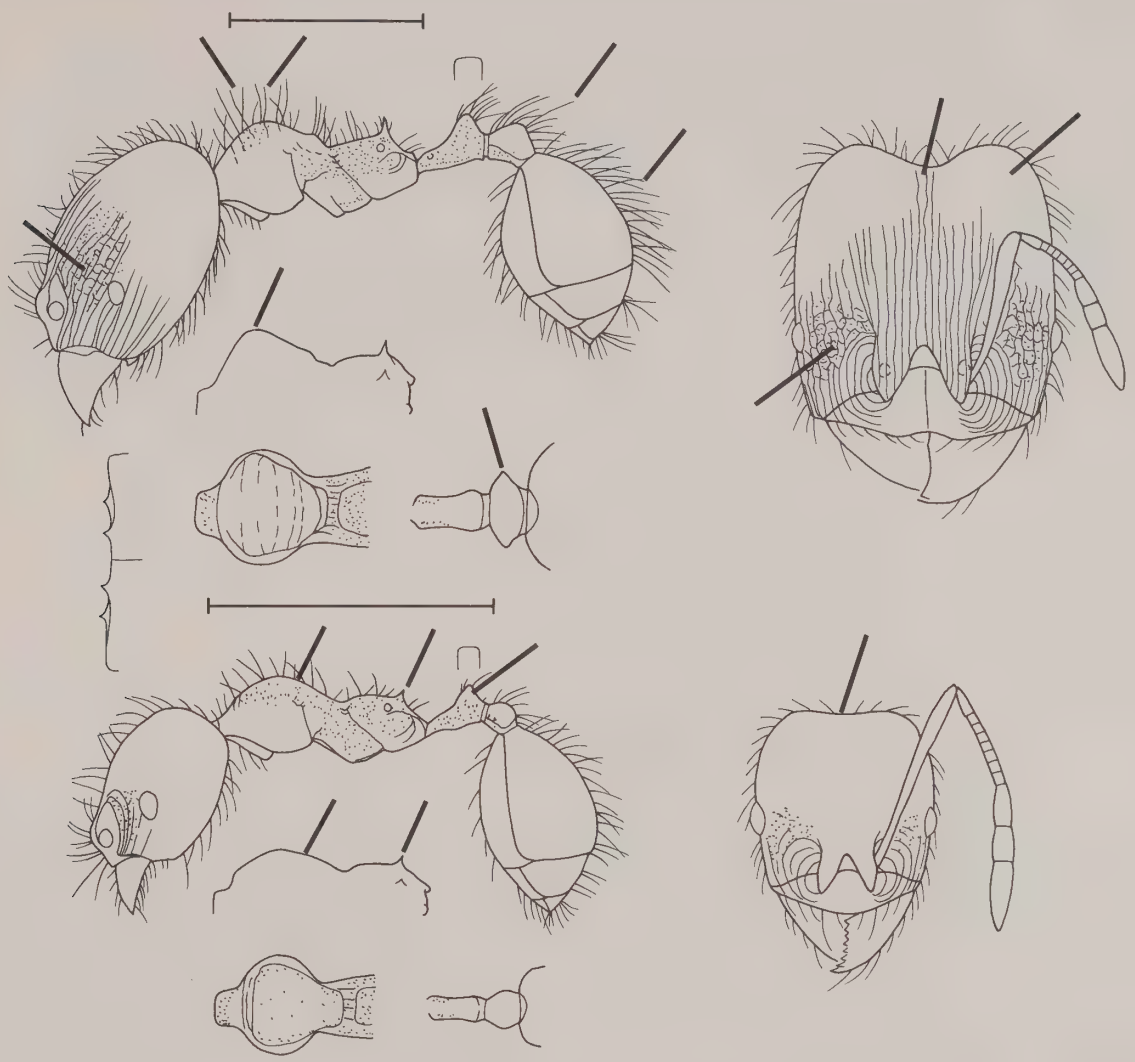
MEASUREMENTS (mm) Holotype major: HW 1.04, HL 1.06, SL 0.62, EL 0.14, PW 0.60.
Paratype minor: HW 0.54, HL 0.56, SL 0.58, EL 0.10, PW 0.34.

COLOR Major: concolorous yellowish red.
Minor: concolorous light reddish brown.

RANGE Known only from the type locality.

BIOLOGY Collected from rainforest canopy.

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: 3 km south of Huatusco, km 38 on Fortin Road, Veracruz (Cornell University Mexico Field Party, August 1960). Scale bars = 1 mm.



Pheidole sabina **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *sabina,* given female name, as Sabina, wife of Hadrian.

DIAGNOSIS Similar in various ways to *balzani, brunnescens, exarata, excubitor, fabricator, germaini, hispaniolae, nigella, prattorum, sarpedon, tristis, tristops,* and *unicornis,* and differing as follows.

Major: pilosity very dense and long, with many of the hairs more than 2× Eye Length; a rugoreticulum extends from eye to antennal fossa and frontal lobe on each side of head; carinulae along midline of head reach occiput; occipital corners smooth; humerus in dorsal-oblique view high; mesonotal convexity very low; postpetiole from above spinose.

Minor: occiput broad, slightly concave, lacking nuchal collar; promesonotal profile smoothly semicircular; petiolar node from side tapers to a point; propodeal spines reduced to denticles.

MEASUREMENTS (mm) Holotype major: HW 1.08, HL 1.16, SL 0.60, EL 0.12, PW 0.60.
Paratype minor: HW 0.52, HL 0.54, SL 0.50, EL 0.06, PW 0.34.

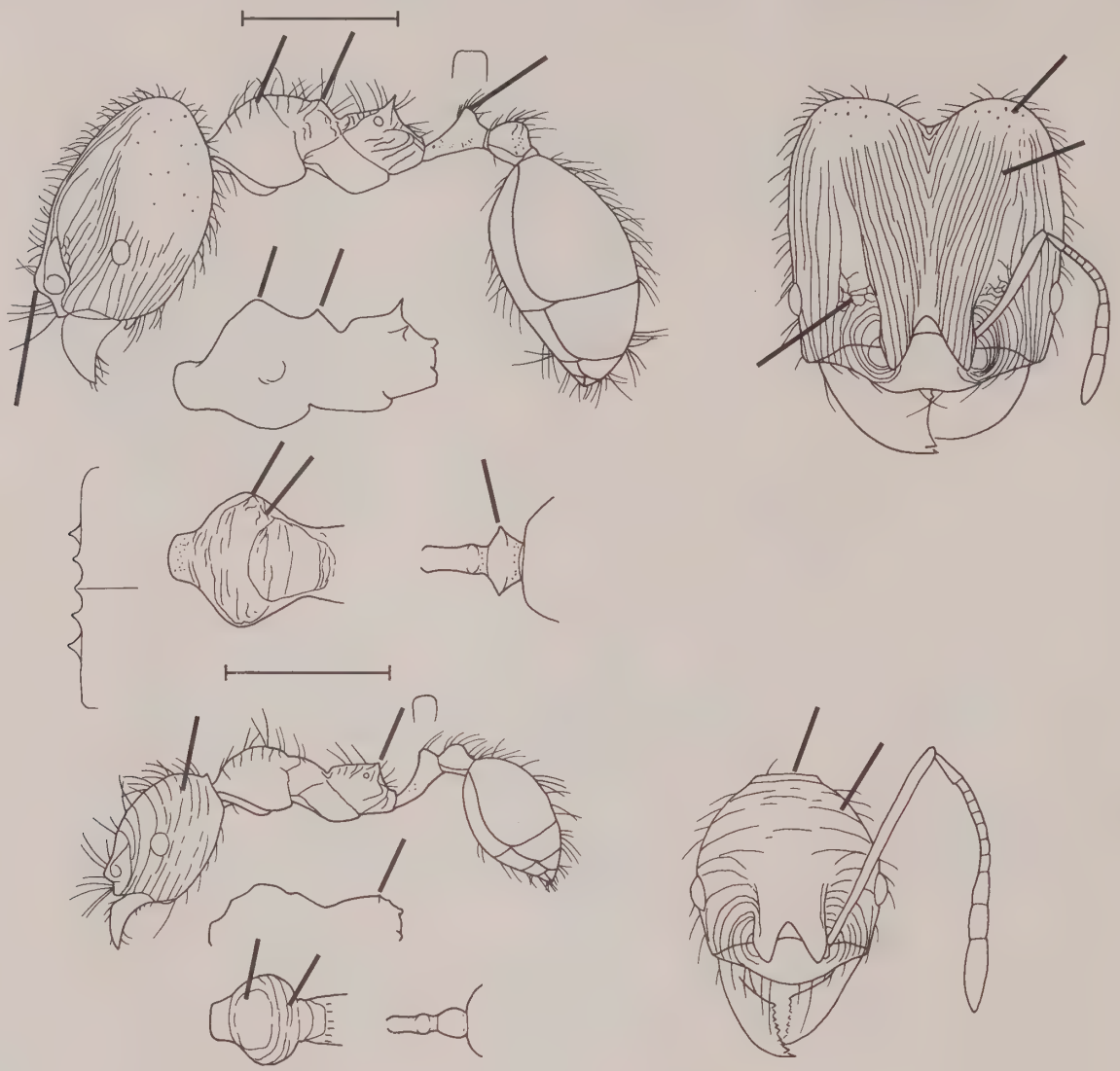
COLOR Major: body and head medium brown except for head anterior to eyes, which is brownish yellow; legs dark yellow.
Minor: body and head light brown except for head anterior to eyes, which is yellow; appendages yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

Compare with *alpinensis, androsana, antillana, avia, bakeri, guilelmimuelleri, praeses*

FIGURE Upper: syntype, major. Lower: syntype, minor. BRAZIL: Botucatu, São Paulo. Scale bars = 1 mm.

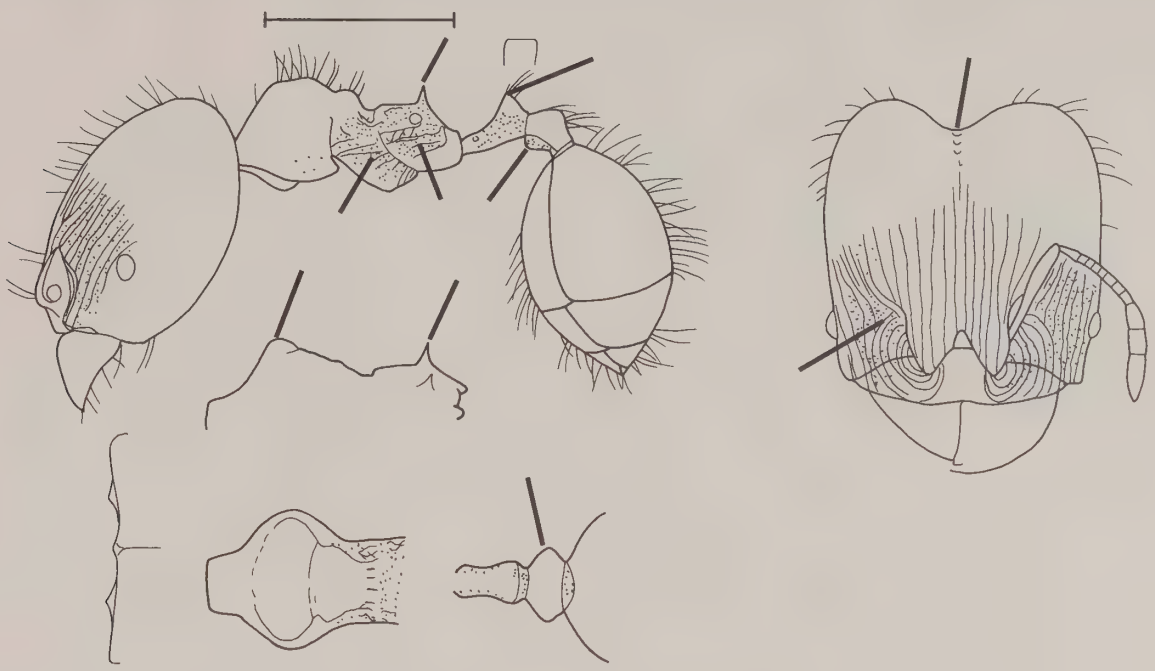


Pheidole sarcina Forel, **new status**

Pheidole breviconus var. *sarcina* Forel 1912g: 230.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY L *sarcina,* package, bundle, possibly alluding to frontal cephalic carinulae.
DIAGNOSIS Similar in various traits to the species listed above, differing in the following combination.
Major: frontal lobes project for short distance as lobes, in side view; humerus obliquely subangulate and mesonotal convexity right-angulate in dorsal-oblique view; petiolar node tapers to a rounded point in side view; postpetiole spinose; shallow, narrow antennal scrobe present; carinulae originating on frontal lobes spread outward all the way to the occiput; occipital lobes smooth with scattered foveae; small rugoreticulum behind each antennal fossa; most of pronotal dorsum and propodeal dorsum carinulate.
Minor: occiput narrow, with nuchal collar; all of posterior dorsum of head and almost all of mesonotal and propodeal dorsa "tiger-striped" with semicircular and transverse carinulae; propodeal spine reduced to denticle.
MEASUREMENTS (mm) Syntype major: HW 1.54, HL 1.54, SL 0.80, EL 0.18, PW 0.72.
Syntype minor: HW 0.60, HL 0.70, SL 0.82, EL 0.12, PW 0.46.
COLOR Major: body medium reddish brown, appendages light reddish brown.
Minor: head and mesosoma medium reddish brown; waist, gaster, and appendages light reddish brown.
RANGE Known from type locality, from other localities in São Paulo, and from near Bucay, Guayas, Ecuador (W. L. Brown).
BIOLOGY Unknown.

FIGURE Holotype, major. ECUADOR: Limoncocha, Napo, 250 m (Stewart B. and Jarmila Kukalová-Peck). (Minor unknown.) Scale bar = 1 mm.

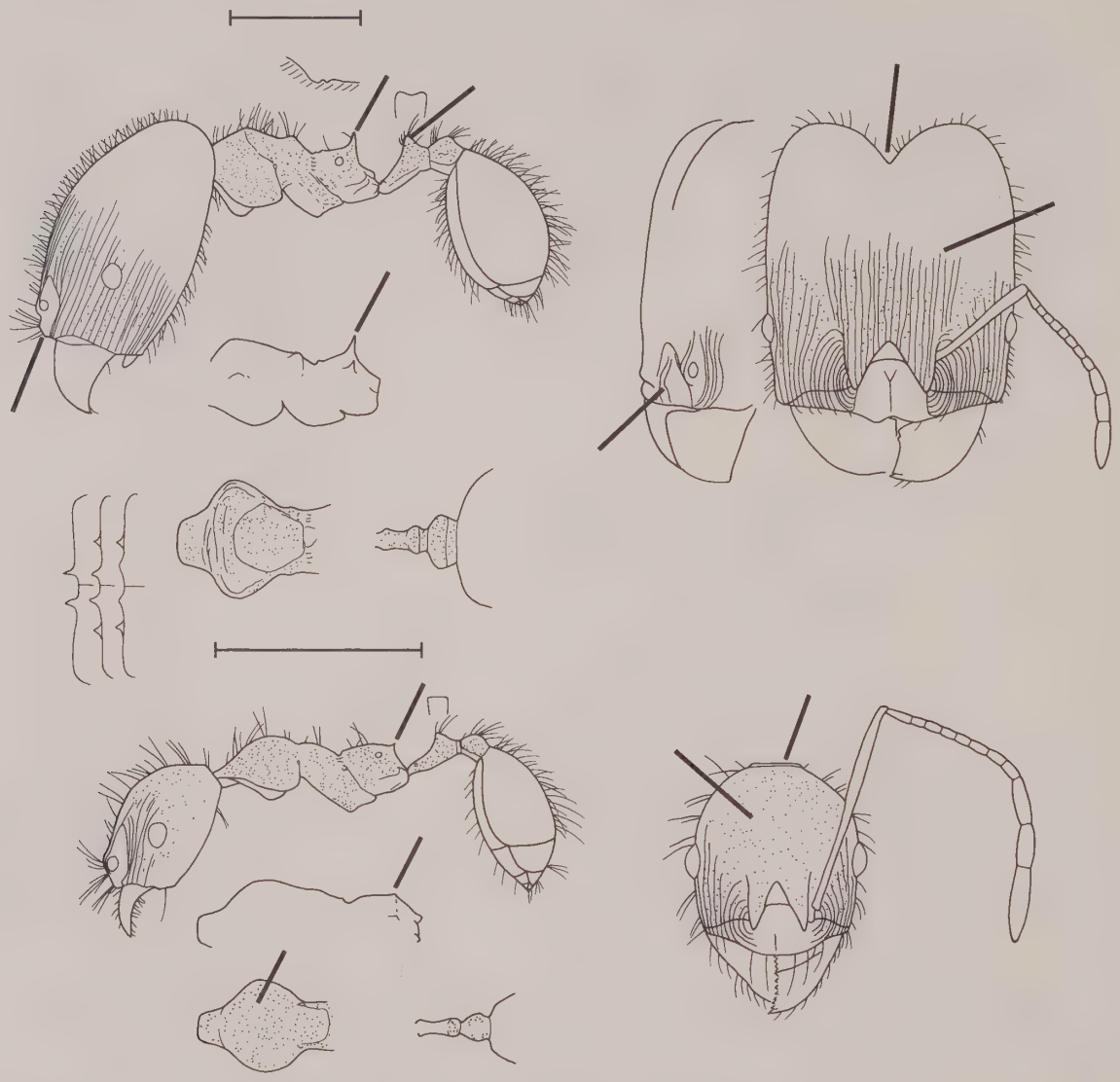


Pheidole sarpedon **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr Sarpedon, mythical commander of Priam's Lycian allies.
DIAGNOSIS Similar in various ways to *balzani, brunnescens, exarata, excubitor, fabricator, germaini, hispaniolae, nigella, prattorum, sabina, tristis, tristops,* and *unicornis,* differing as follows.
Major: reddish yellow; occipital cleft deep and rounded; postpetiolar venter with prominent forward-directed lobe; humerus in dorsal-oblique view elevated prominently as a lobe; propodeal spines vertical to propodeal basal face; carinulae cover anterior half of dorsal head surface, and those mesad to eye bend inward; postpetiolar node from above conulate.
Minor: unknown.
MEASUREMENTS (mm) Holotype major: HW 1.46, HL 1.60, SL 0.80, EL 0.14, PW 0.68.
COLOR Major: body medium to dark reddish yellow, mandibles and antennal scapes reddish brown, legs light reddish yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with species listed
in the Diagnosis below

FIGURE Upper: lectotype, major (with magnified profile of metanotum and surrounding area shown above side view; and below head, three hypostomas, the lectotype on the left and two examples from an Anápolis, Goiás, series in the middle and on right). Lower: paralectotype, minor. BRAZIL: Goiânia, Goiás. Scale bars = 1 mm.



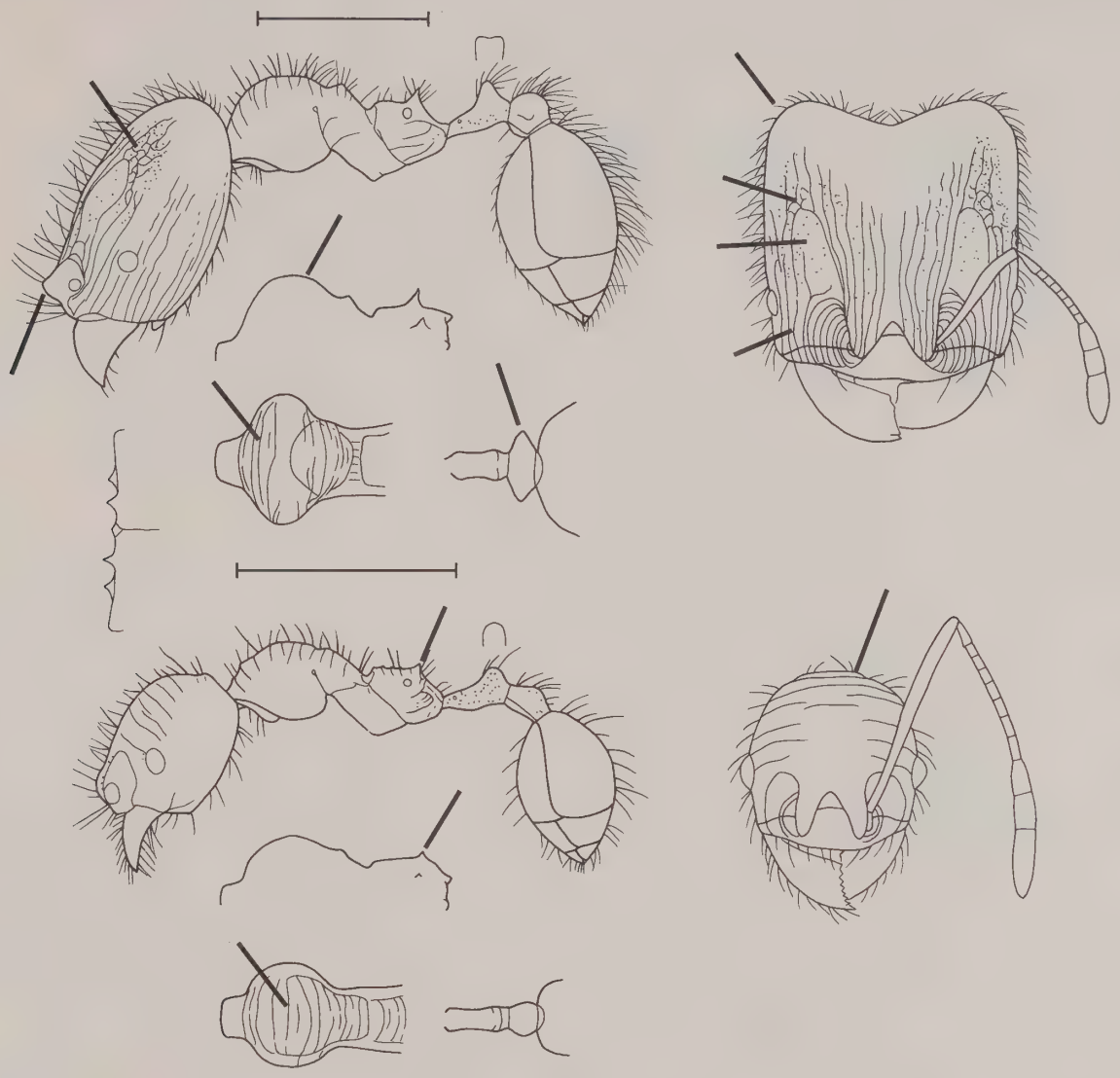
Pheidole schwarzmaieri Borgmeier

Pheidole schwarzmaieri Borgmeier 1939: 420.

TYPES Mus. Zool. Univ. São Paulo.
ETYMOLOGY Eponymous.
DIAGNOSIS Similar to *amata, ambigua, celaena, fera, germaini, peruviana, rutilana, superba,* and *vomer,* differing as follows.
Major: large, rich reddish brown; center of median clypeal carinae projects forward as a short lobe; head subrectangular, elongate, with deep occipital cleft; posterior half of dorsal head surface smooth and shiny, anterior half carinulate; no rugoreticulum; small metanotal convexity present in addition to mesonotal convexity; propodeal spines in side view large and vertical to propodeal basal face; apex of petiolar node in side view tapers to a blunt point; mesosoma and waist foveolate and opaque.
Minor: occiput narrow, with nuchal collar; all of body foveolate and opaque except gaster, which is entirely smooth; propodeal spines reduced to denticles.
MEASUREMENTS (mm) Lectotype major: HW 2.02, HL 2.50, SL 1.00, EL 0.24, PW 0.80.
Paralectotype minor: HW 0.64, HL 0.72, SL 0.84, EL 0.12, PW 0.42.
COLOR Major: head, mandibles, and mesosoma rich medium reddish brown; waist and gaster plain medium to dark brown; appendages yellowish brown.
Minor: head and gaster medium brown; mesosoma, waist, and appendages light brown.
RANGE Recorded from Goiás, Mato Grosso, Minas Gerais, and São Paulo in southern Brazil and Misiones in northern Argentina (Kempf 1972b).
BIOLOGY Unknown.

Compare with *fullerae, gauthieri, guayasana, hetschkoi, heyeri, napoensis*

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Finca Los Guaduales, 10 km southwest of San José del Palmar, Rio Torito, 800 m (Charles Kugler). Scale bars = 1 mm.



Pheidole securiger **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *securiger,* axe-bearing, alluding to the extended frontal lobes.

DIAGNOSIS Similar to *pidax, rosae, rosula,* and especially to *guayasana,* differing as follows.

Major: reddish yellow; frontal lobes extended forward as conspicuous right-angular and slightly upward-turning processes, seen from the side; antennal scrobes present, each followed posteriorly by a patch of rugoreticulum; rugoreticulum absent from anterior half of head; occipital lobes in full-face view tending toward subangulate; posterior half of pronotal profile smoothly convex in dorsal-oblique view; metanotum and dorsal propodeal face covered by transverse carinulae.

Minor: propodeal spines small, but well developed; entire promesonotal dorsum transversely carinulate; lateral margins of posterior half of head entirely carinulate.

MEASUREMENTS (mm) Holotype major: HW 1.58, HL 1.72, SL 0.78, EL 0.16, PW 0.80.
Paratype minor: HW 0.64, HL 0.68, SL 0.80, EL 0.04, PW 0.42.

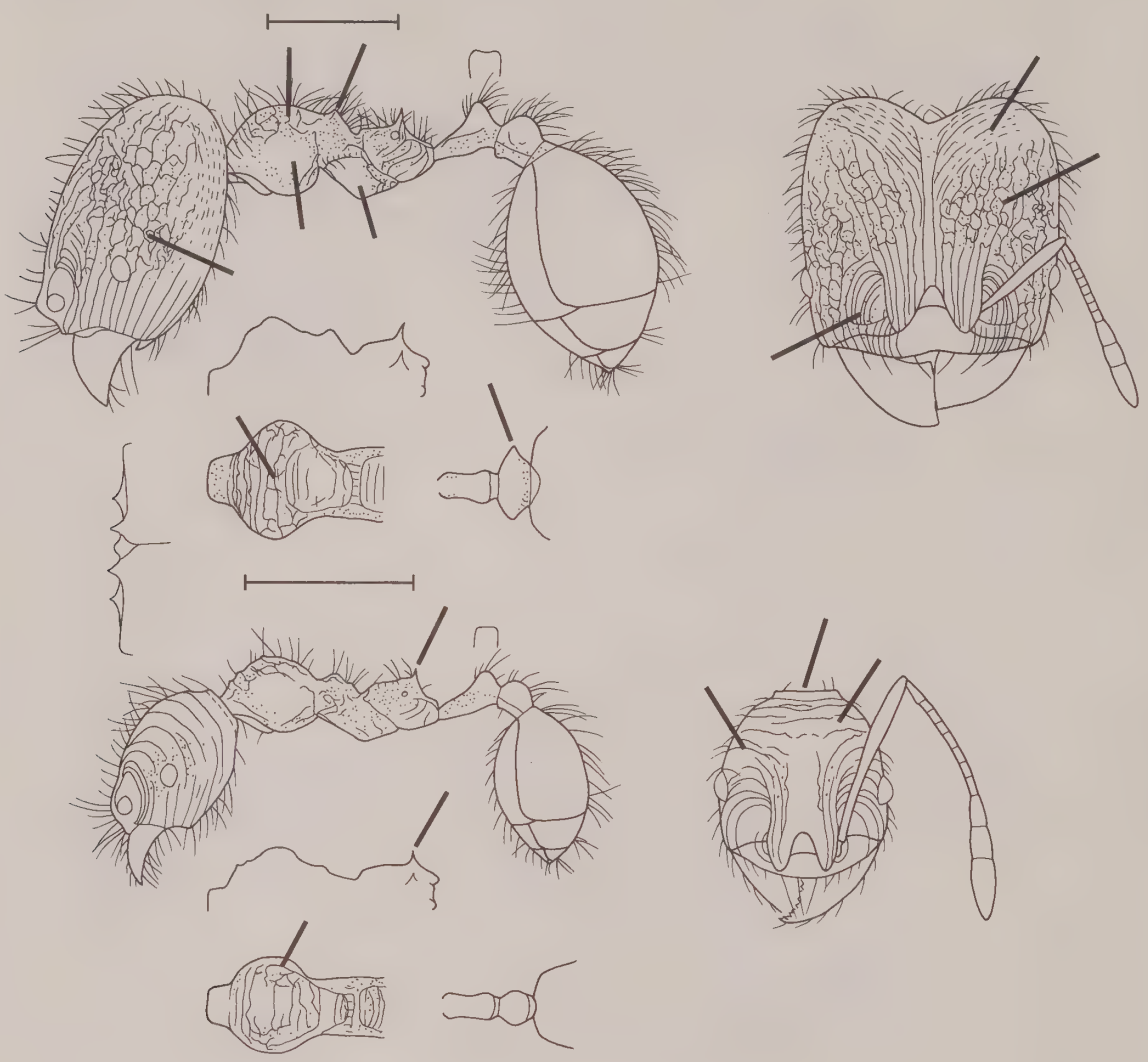
COLOR Major: body dark reddish yellow, gaster plain medium brown, appendages medium yellow.
Minor: body light brownish yellow, appendages clear medium yellow.

RANGE Known only from the type locality.

BIOLOGY The type colony was collected in spiny bamboo forest *(Guadua)*. A male was present in the nest at the time of collection 1–4 June.

Compare with species listed
in the Diagnosis below

FIGURE Upper: major (Agua Funda, near São Funda, São Paulo; W. L. Brown; associated with minor compared with lectotype minor). Lower: minor (Agua Funda, São Paulo; compared with lectotype minor). (Type locality: Passa Quatro, Minas Gerais, Brazil; no majors were in type series.) Scale bars = 1 mm.

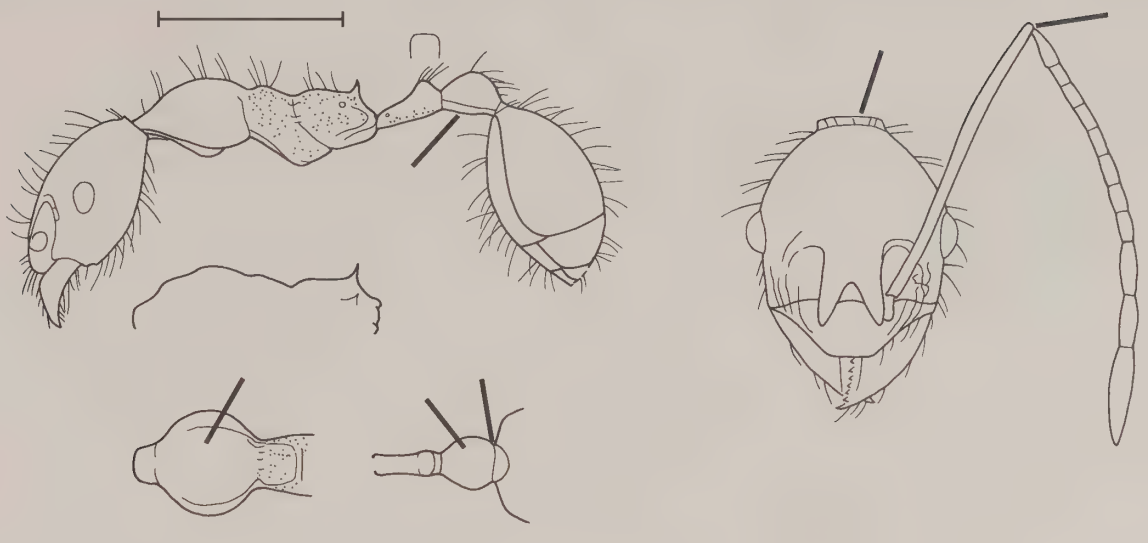


Pheidole senilis Santschi, **new status**

Pheidole hetschkoi var. *senilis* Santschi 1929d: 289.

TYPES Naturhist. Mus. Basel.
ETYMOLOGY L *senilis,* old, aged, probably alluding to the wrinkly head surface.
DIAGNOSIS Similar to *aper, bambusarum, brevicona, dyctiota, laeviventris, lutzi, risii, rugatula, sigillata, trachyderma*, and *traini,* differing as follows.
Major: very large; in full-face view, occiput covered by faint oblique carinulae that originate on midline and turn outward; most of vertex and sides of head rugoreticulate, frontal lobes carinulate; in full-face view, semicircular carinulae of antennal fossa are sharply demarcated from the carinulae that cross over anteriorly to the lateral wings of the clypeus; pronotal dorsum loosely rugoreticulate, with sides and lower half of the mesopleuron smooth; postpetiole 2× broader than petiole, and spinose.
Minor: posterior dorsum and sides of head "tiger-striped" with semicircular carinulae; humeri rugoreticulate; occiput narrow, with nuchal collar.
MEASUREMENTS (mm) Major (Agua Funda, São Paulo): HW 2.20, HL 2.34, SL 1.00, EL 0.24, PW 1.04.
Lectotype minor: HW 0.80, HL 0.84, SL 0.94, EL 0.16, PW 0.56.
COLOR Major and minor: body medium reddish brown, appendages reddish yellow.
RANGE Minas Gerais and São Paulo states, Brazil.
BIOLOGY The Agua Funda colony was collected in rotten wood.

FIGURE Syntype, minor. FRENCH GUIANA: Cayenne. Scale bar = 1 mm.



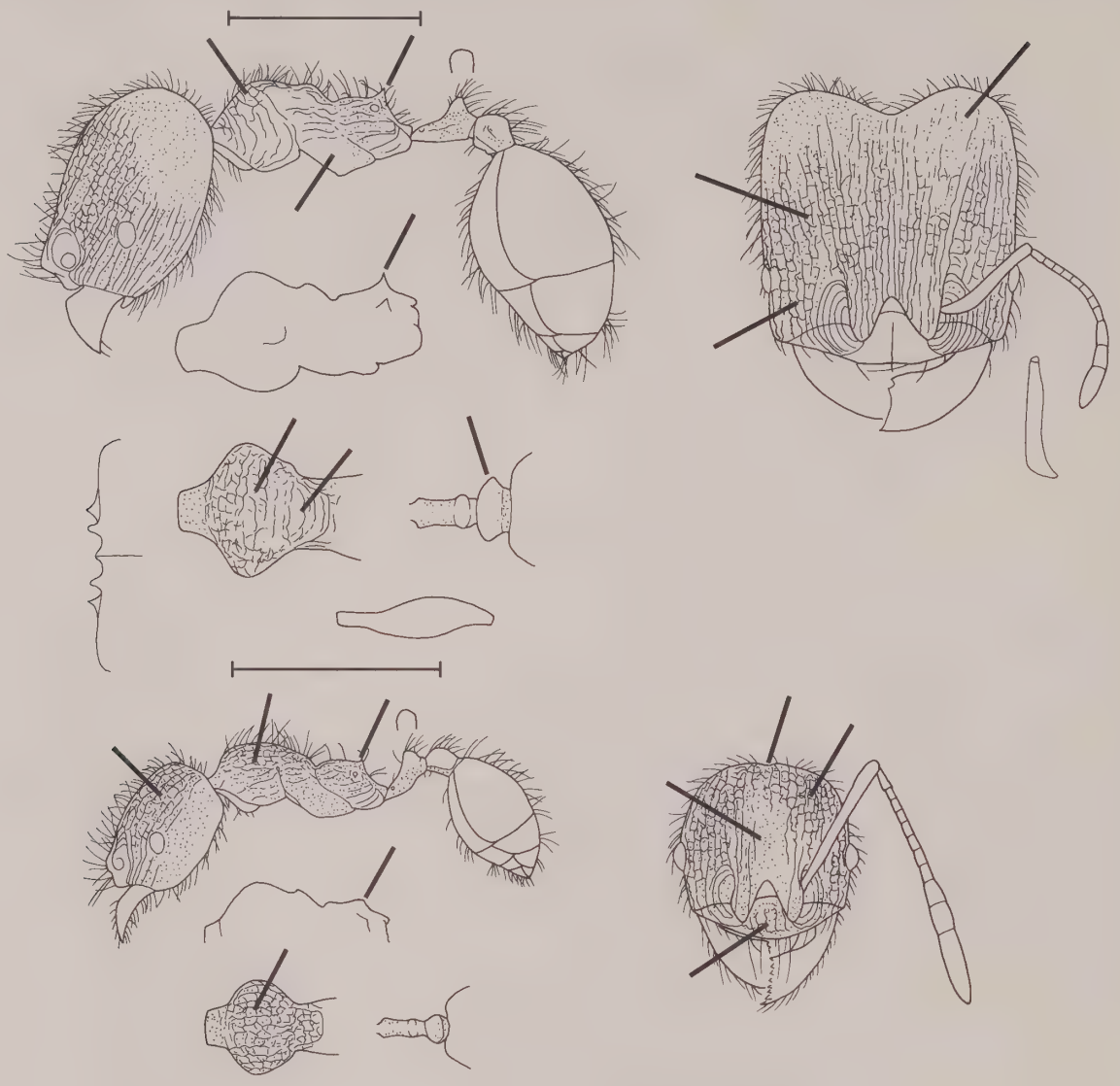
Pheidole severini Forel

Pheidole severini Forel 1904e: 171.

TYPES Mus. Hist. Nat. Genève (syntype minor only; major not located, may be in the Musée de Bruxelles, the source of Forel's material).
ETYMOLOGY Eponymous.
DIAGNOSIS A member of the *tristis* group, similar (in the **minor** caste, the only one available in this study) to *excubitor, grandinodus,* and *obrima* in the greatly enlarged postpetiole and overall habitus, differing in the shallow, nearly flat venter of the postpetiole in side view; constricted ventral margin of the postpetiolar node from above; much longer antennal scapes; and more prominent nuchal collar.
MEASUREMENTS (mm) Syntype minor: HW 0.74, HL 1.02, SL 1.32, EL 0.20, PW 0.52.
COLOR Minor: concolorous dark yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. Caraguatatuba Reserva Florestal, São Paulo, 40–80 m (William L. Brown). Scale bars = 1 mm.



Pheidole sigillata **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *sigillata,* adorned with little figures or marks, referring to variable sculpturing among different parts of body.

DIAGNOSIS Similar in various traits to *aper*, *bambusarum, brevicona, dyctiota, laeviventris, lutzi, risii, rugatula, senilis, trachyderma,* and *traini,* differing as follows.

Major: vertex and sides of dorsal surface of head rugoreticulate; occipital lobes foveolate and opaque; frontal lobes carinulate; pronotal dorsum rugoreticulate; sides of pronotum rugulose; metanotum sparsely rugulose; propodeal spines equilaterally triangular.

Minor: occiput slightly constricted, but lacking nuchal collar; occiput, sides of head, and mid-clypeus in full-face view rugoreticulate; promesonotal dorsum rugoreticulate; propodeal spines equilaterally triangular.

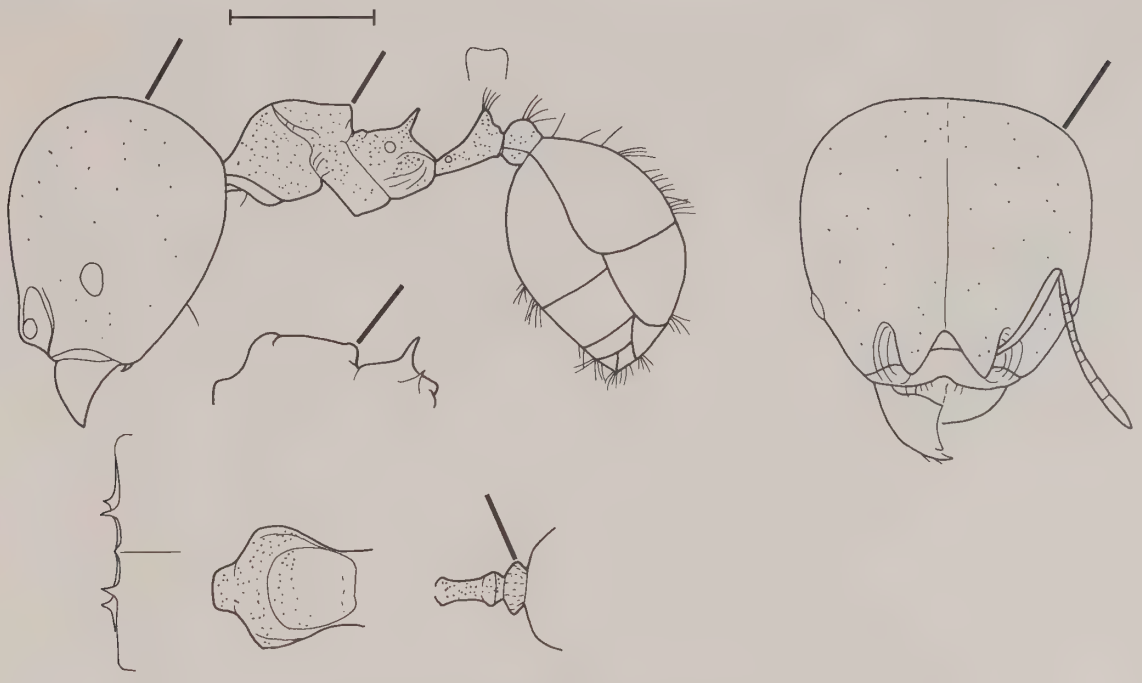
MEASUREMENTS (mm) Holotype major: HW 1.34, HL 1.38, SL 0.56, EL 0.12, PW 0.64.
Paratype minor: HW 0.54, HL 0.56, SL 0.54, EL 0.10, PW 0.38.

COLOR Major: concolorous light brown.
Minor: body yellowish brown except for anterior fourth of head capsule, which is a lighter shade of brownish yellow; appendages brownish yellow.

RANGE Known from the type locality.

BIOLOGY The type colony was found in lowland rainforest.

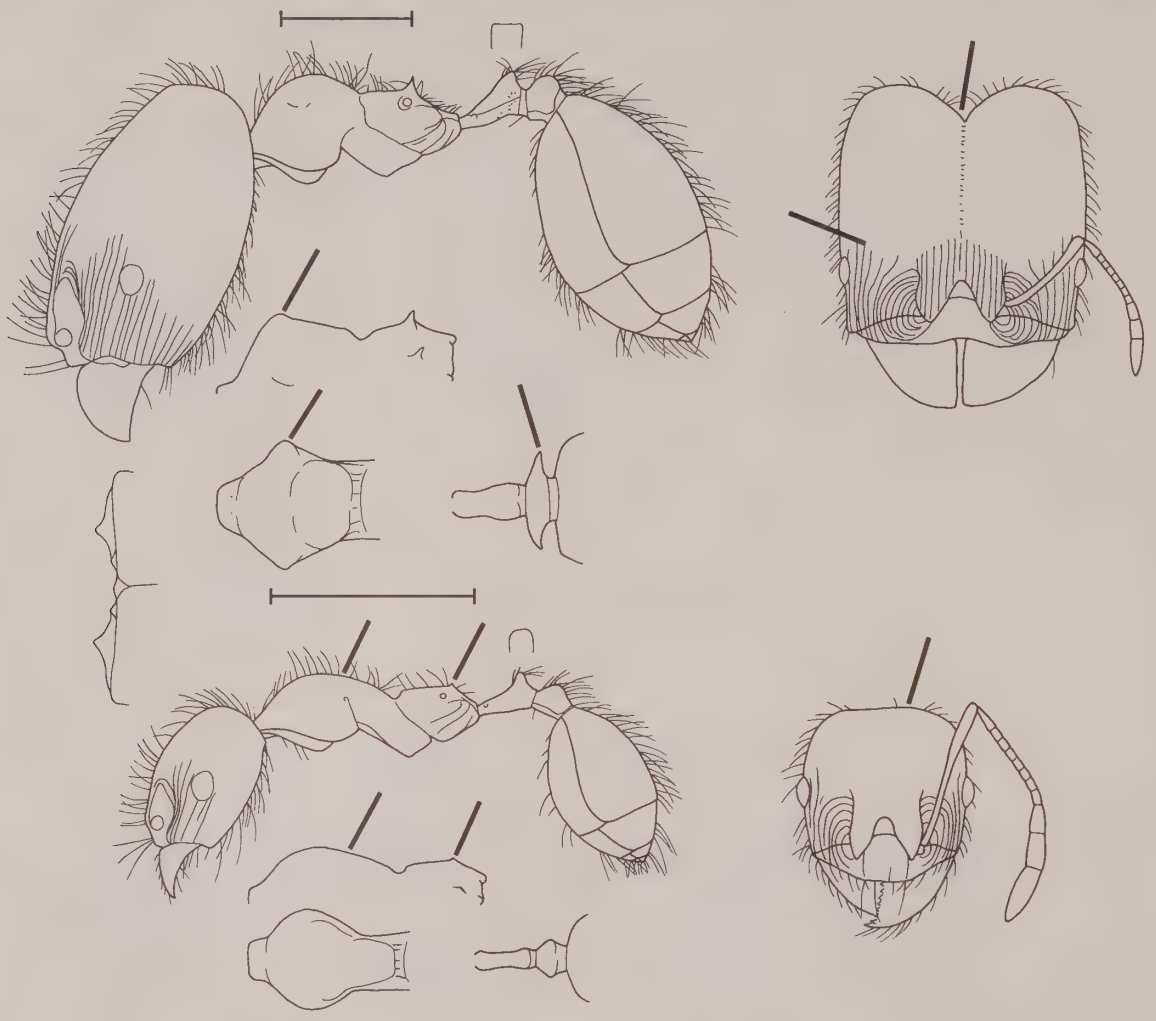
FIGURE Holotype, major. COLOMBIA: St. Augustin, Huila (L. Garling). Scale bar = 1 mm.



Pheidole sphaerica **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr *sphaerica,* shaped like a ball, alluding to the head.
DIAGNOSIS A large, spectacularly distinct species whose **major** has a huge spherical head, proportionately reduced clypeus and mandibles, a mesonotum that drops vertically in side view to the metanotum, and a near-absence of pilosity on the head and mesosoma.
MEASUREMENTS (mm) Holotype major: HW 1.98, HL 1.92, SL 0.84, EL 0.24, PW 0.90.
COLOR Major: head, appendages, and most of gaster light reddish yellow (light "orange"); mesosoma, waist, and part of gaster medium reddish yellow (medium "orange").
RANGE Known only from the type locality.
BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ARGENTINA: Jandil, Buenos Aires. Scale bars = 1 mm.



Pheidole spininodis Mayr

Pheidole spininodis Mayr 1887: 591. Syn.: *Pheidole hohenlohei* Emery 1888c: 354, synonymy by Emery 1906c: 146; *Pheidole spielbergi* Emery 1888c: 354, n. syn. (provisional); *Pheidole spininodis* var. *pencosensis* Forel 1914d: 271, n. syn.; *Pheidole spininodis* var. *lucifuga* Santschi 1923d: 56, n. syn.; *Pheidole* (*P.*) *spininodis* var. *bruta* Santschi 1929d: 285; n. syn.; *Pheidole spininodis* var. *solaris* Santschi 1929d: 287, n. syn.

TYPES Naturhist. Mus. Wien.

ETYMOLOGY L *spininodis,* thorny knot, referring to the spinose postpetiole of the major.

DIAGNOSIS Similar in various traits to *exarata, excubitor, germaini, gibba, rogeri, stulta, tristis, tristops,* and *zoster,* distinguished as follows.

Major: large; reddish yellow; postpetiolar node extremely drawn out, wide but short, and spinose; carinulae extend posteriorly to just beyond eye level, and entire rest of body smooth and shiny; head subrectangular; occipital cleft deep, its nadir acute-angular; antennal scapes very short.

Minor: occiput broad, lacking nuchal collar; carinulae reach posteriorly just beyond eye level, and entire remainder of body smooth and shiny; dorsal promesonotal profile semicircular.

P. spielbergi of southern Brazil may prove to be a distinct species: the syntype major is smaller than the *spininodis* lectotype, and the minor larger; the major scape is longer; and the major hind femora are thicker.

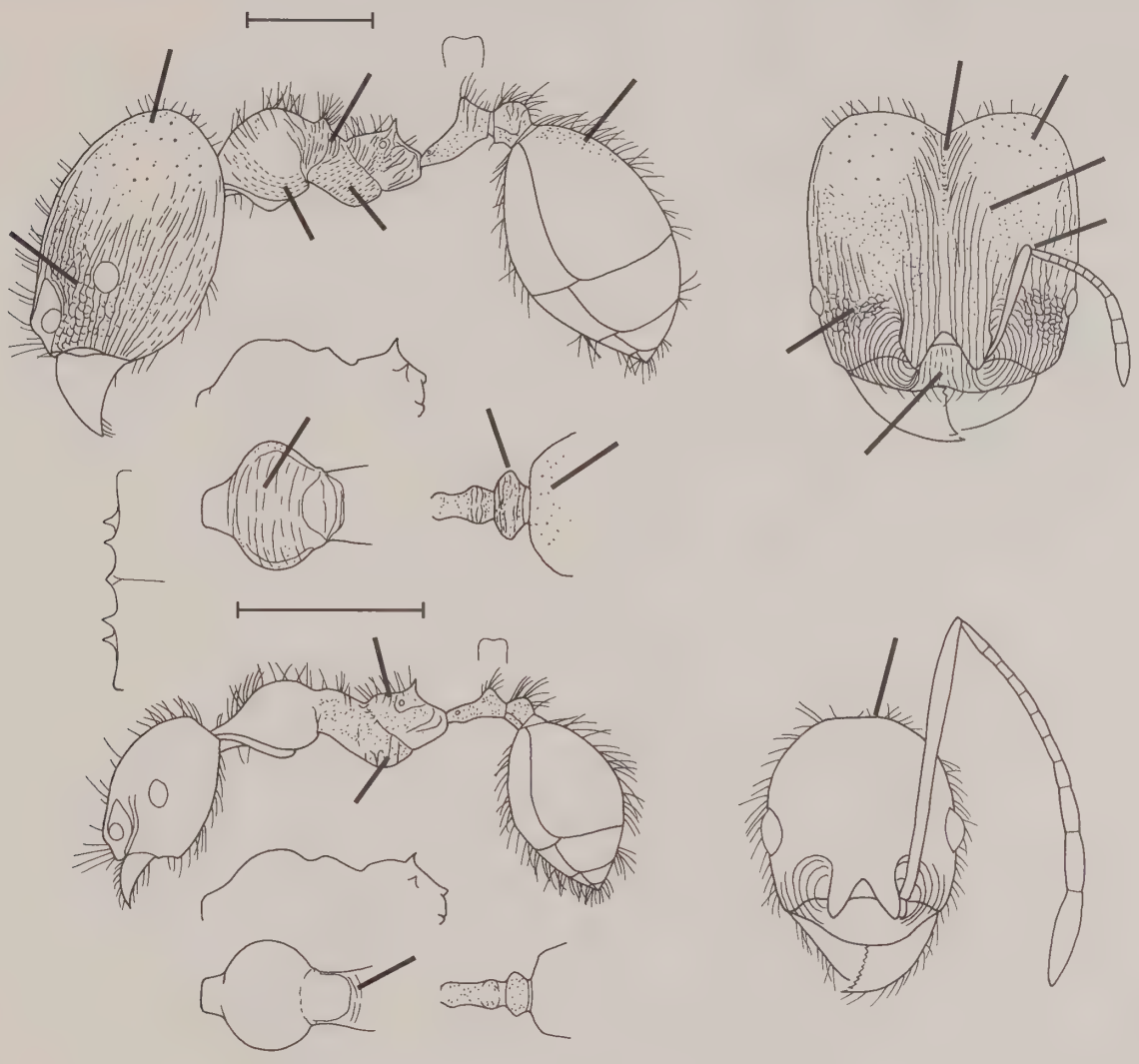
MEASUREMENTS (mm) Lectotype major: HW 2.32, HL 2.46, SL 0.92, EL 0.26, PW 1.00.
Paralectotype minor: HW 0.74, HL 0.76, SL 0.74, EL 0.12, PW 0.46.

COLOR Major: head, mesosoma, and appendages medium reddish yellow; waist and gaster plain medium brown.
Minor: body plain medium brown, appendages light brown.

RANGE Widespread in northern and central Argentina (Bruch 1916; Kempf 1972b), and also recorded from Rio Grande Do Sul (synonymous *P. spielbergi*).

BIOLOGY In the central Argentina province of San Luis, Bruch (1916) found "var. *pencosensis*" in dry scrub, nesting in soil of varying grain and hardness, and once beneath dried cow dung. The nest entrances were circular and surrounded by semicircular banks of excavated earth, and galleries and chambers descended to about 30 cm.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. COLOMBIA: Dibulla, Guajira (Auguste Forel). Scale bars = 1 mm.



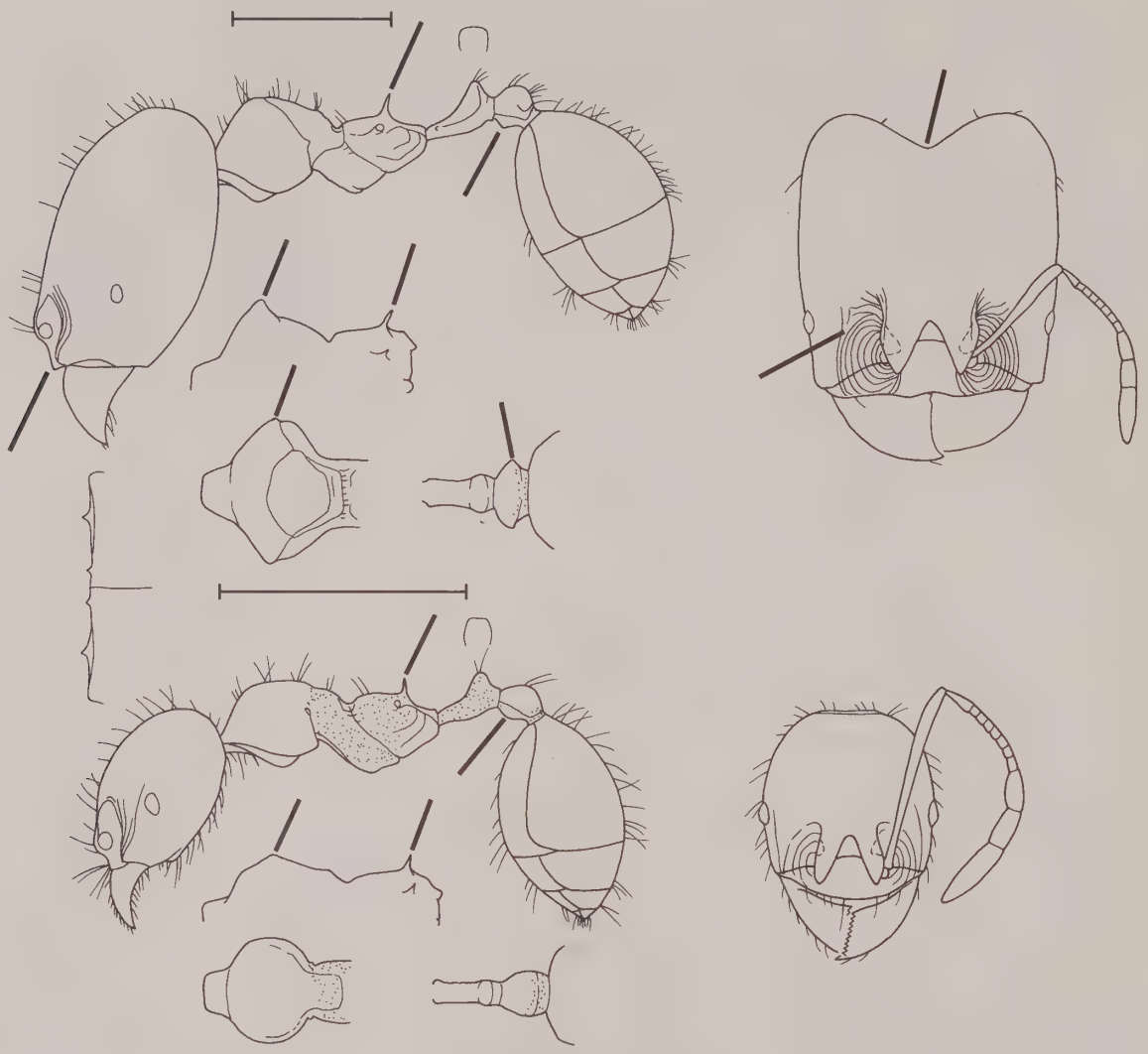
Pheidole steinheili Forel

Pheidole steinheili Forel 1901j: 353.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY Eponymous, no further attribution.
DIAGNOSIS A large, distinctive species of the *tristis* group with no clear affinities.
Major: head capsule in full-face view roughly circular in outline, with smoothly semicircular occipital lobes; carinulae originating along the midline of the dorsal half of the head turn outward; occipital lobes mostly smooth, with a sprinkling of foveae; antennal scape very short, its tip reaching the lateral head margin just posterior to the eye; entire clypeus, most of mesosoma, and dorsum of waist carinulate; anterior half of central strip of first gastral tergite shagreened; postpetiole cone-shaped.
Minor: occiput very narrow but lacks nuchal collar; part of propodeal dorsum and lower fringe of mesopleuron carinulate.
MEASUREMENTS (mm) Lectotype major: HW 2.16, HL 2.20, SL 1.00, EL 0.28, PW 1.04.
Paralectotype minor: HW 0.74, HL 0.84, SL 1.00, EL 0.18, PW 0.48.
COLOR Major: body medium to dark reddish brown except for posterior half of head capsule, which is light reddish brown; appendages light reddish brown.
Minor: concolorous plain light brown.
RANGE Known only from the type locality.
BIOLOGY The type colony was very populous, in loose soil and covered by multiple craters (A. Forel).

Compare with species listed
in the Diagnosis below

FIGURE Upper: major. Lower: minor. PANAMA: Barro Colorado Island (L. Hane). (Major compared with *stulta* syntype from Colombia; queens from the Barro Colorado and syntype series were also matched.) (Type locality: Caravelas, Bahia, Brazil.) Scale bars = 1 mm.

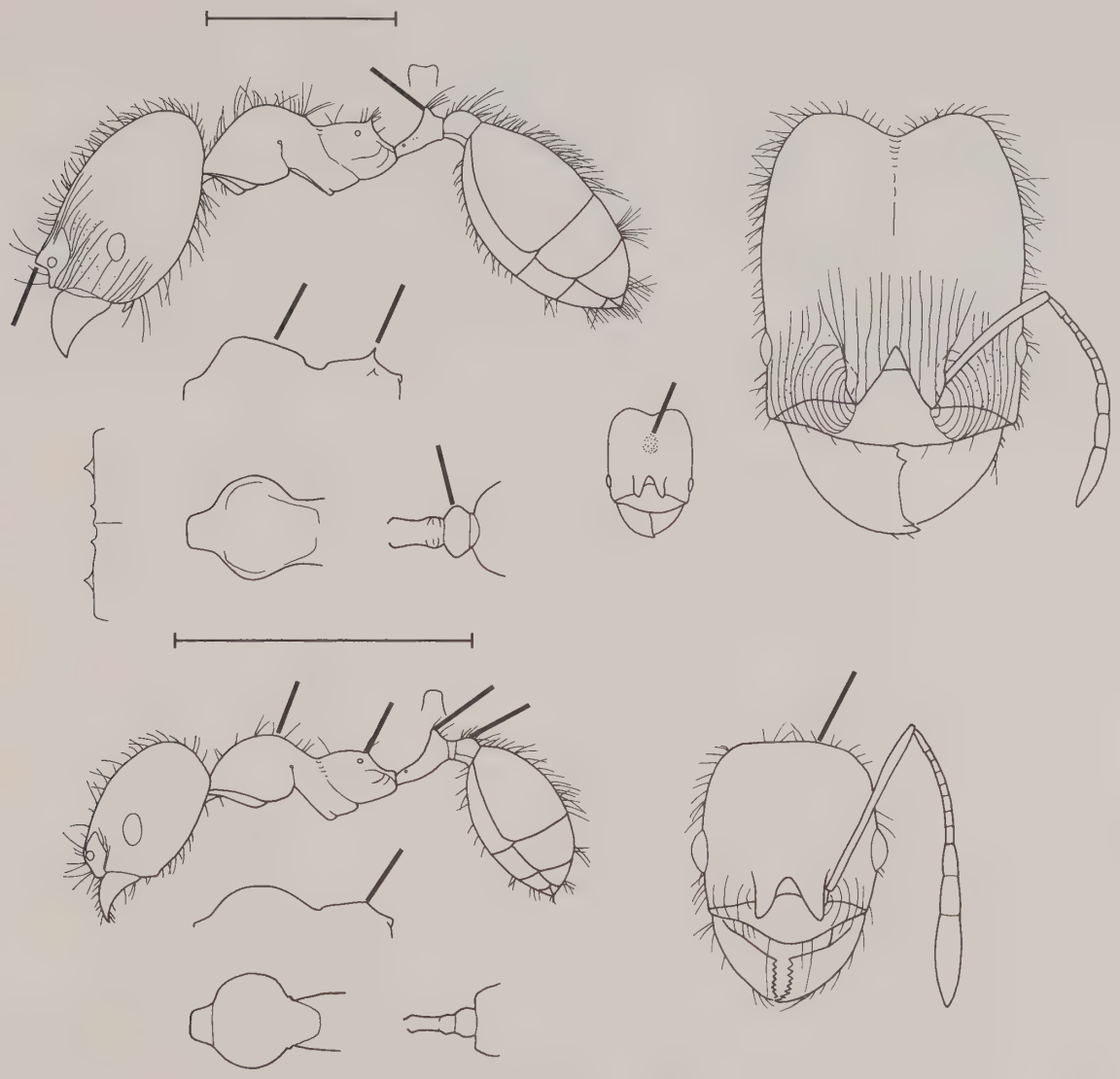


Pheidole stulta Forel

Pheidole stulta Forel 1886b: xlvi. Syn.: *Pheidole championi* Forel 1899e: 72, n. syn.; *Pheidole championi* var. *sima* Forel 1912g: 234, n.syn. (See note in the Diagnosis below.)

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY L *stulta,* fool, allusion unknown.
DIAGNOSIS A large, yellow, sparsely sculptured member of the *tristis* group.
Major: very prominent, subangulate, pronotal humerus in dorsal-oblique view, no sculpturing behind the posterior half of the head or any part of the body; a cornulate postpetiolar node; and a small but conspicuous rounded subpostpetiolar process. The Colombia syntype major I examined has longitudinal carinulae extending midway up to the center of the dorsum of the head, as opposed to the complete absence of such carinulae in the Panama specimen figured. Further series may indicate that the Central American populations are a distinct species, in which case they would receive the name *championi* Forel.
Similar to *absurda, alpinensis, exarata, excubitor, germaini, gibba, grandinodus, obrima, rogeri, spininodis, tristis,* and *zoster,* differing in details of body form, sculpturing, and pilosity, as illustrated, and color.
MEASUREMENTS (mm) Syntype major (Colombia): HW 1.84, HL 2.26, SL 0.84, EL 0.18, PW 0.94.
Minor (Barro Colorado Island, Panama): HW 0.60, HL 0.66, SL 0.66, EL 0.06, PW 0.38.
COLOR Major: light reddish yellow.
Minor: medium yellow.
RANGE As broadly construed, *stulta* ranges from Bahia in Brazil to Panama.
BIOLOGY Colonies have been found in a tropical forest (Panama) and coffee plantation at 850 m (Colombia); a nest was found on Barro Colorado in a "well rotted log" (L. Hane, collection note).

FIGURE Upper: major. Lower: minor. COLOMBIA: Yumbo. (Compared with syntypes from Santa Catarina, Brazil, by E. O. Wilson.) (Type locality: Cayenne, French Guiana, collected by M. Jelski.) Scale bars = 1 mm.



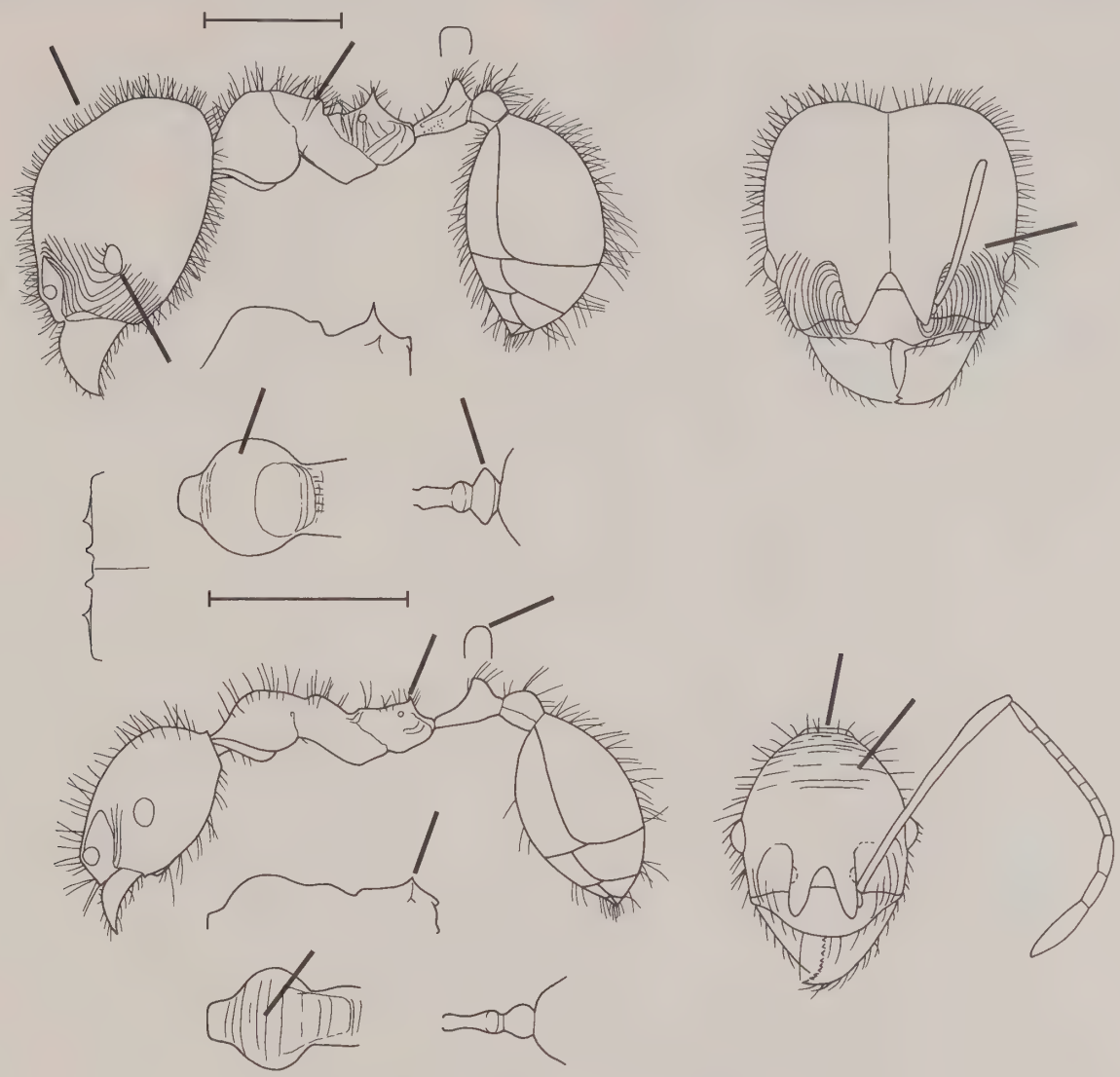
Pheidole subarmata Mayr

Pheidole subarmata Mayr 1884: 37. Syn.: *Pheidole cornutula* Emery 1890c: 52 (footnote), synonymy by Brown 1981: 526; *Pheidole subarmata* var. *elongatula* Forel 1893j: 408, synonymy by Brown 1981: 526; *Pheidole subarmata* var. *nassavensis* Wheeler 1905c: 92, synonymy by Brown 1981: 526; *Pheidole cornutula* var. *imbecillis* Emery 1906c: 151, synonymy by Brown 1981: 526; *Pheidole subarmata* var. *borinquenensis* Wheeler 1908a: 133, syn. by Brown 1981: 526; *Pheidole hondurensis* Mann 1922: 25, synonymy by Brown 1981: 526; *Pheidole cornutula* var. *dentimentum* Santschi 1929d: 285, synonymy by Brown 1981: 526; *Pheidole subarmata* var. *nefasta* Santschi 1929d: 285, synonymy by Brown 1981: 526.

TYPES Naturhist. Mus. Wien.
ETYMOLOGY L *subarmata,* presumably, less well armed, referring to the small propodeal spines.
DIAGNOSIS Similar to *allarmata, cramptoni, hasticeps, synarmata,* and *triplex,* differing from them and other *Pheidole* by the following combination of traits.
Major: head elongate; frontal lobes seen from the side triangular, pointing slightly downward; pronotum low and rounded, descending into the mesonotum in a weakly convex, continuous curve; propodeal spines very small; carinulae limited to the anterior half of the head, and those immediately mesad to the eyes reaching only to the posterior margins of the eyes; rest of head and body smooth and shiny.
Minor: occiput broad, lacking nuchal collar; propodeal spines reduced to denticles; except for circular carinulae of the antennal fossa, entire head and body smooth and shiny.
I have confirmed most of the synonymies made by William L. Brown (1981) and listed above.
MEASUREMENTS (mm) Paralectotype major (Santa Catarina, Brazil): HW 0.94, HL 1.18, SL 0.50, EL 0.14, PW 0.54.
Lectotype minor: HW 0.42, HL 0.48, SL 0.42, EL 0.08, PW 0.28.

COLOR Major: reddish yellow to dark brown, including appendages; on some specimens at least, there is a diffuse round light brown spot on the vertex, as illustrated.
Minor: light yellowish brown, appendages yellow.
RANGE *Pheidole subarmata* is one of the most abundant and wide-ranging species of New World *Pheidole,* as evidenced by the heavy synonymic fouling cited above. It has been recorded from Veracruz, Mexico, south to Santa Catarina in southern Brazil, and widely through the West Indies, including the Bahamas, Cuba, Puerto Rico, and some of the Lesser Antilles, including St. Vincent and Grenada. It has also been found on Cocos Island off the Pacific Coast of Costa Rica.
BIOLOGY *Pheidole subarmata* favors moist soil in open places, including habitats seriously disturbed by human activity—such as the edges of dirt roads, agricultural fields, coconut groves, secondary rainforest, city parks, and seashores. When exploring in the deeper rainforest is done, it is usually easy for the collector to add *subarmata* to his list by searching adjacent roads and fields. On St. Vincent, the indefatigable H. H. Smith (in Forel 1893j) found colonies of this species from sea level to 460 m. The nests are usually constructed in open soil or soil beneath rocks or sod, but also occasionally in pieces of rotting wood. When in the open they are marked by irregular accumulations of excavated soil. The galleries are irregular and difficult to follow by excavation, although I was able to do so in a Costa Rican banana plantation by digging a lateral pit and shaving the soil away from the side. The colonies are relatively small, with workers numbering probably only in the hundreds. On St. Vincent, H. H. Smith observed workers foraging on the ground and bushes. He found colony-founding queens in November.

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Chinchina (W. L. Brown). Scale bars = 1 mm.

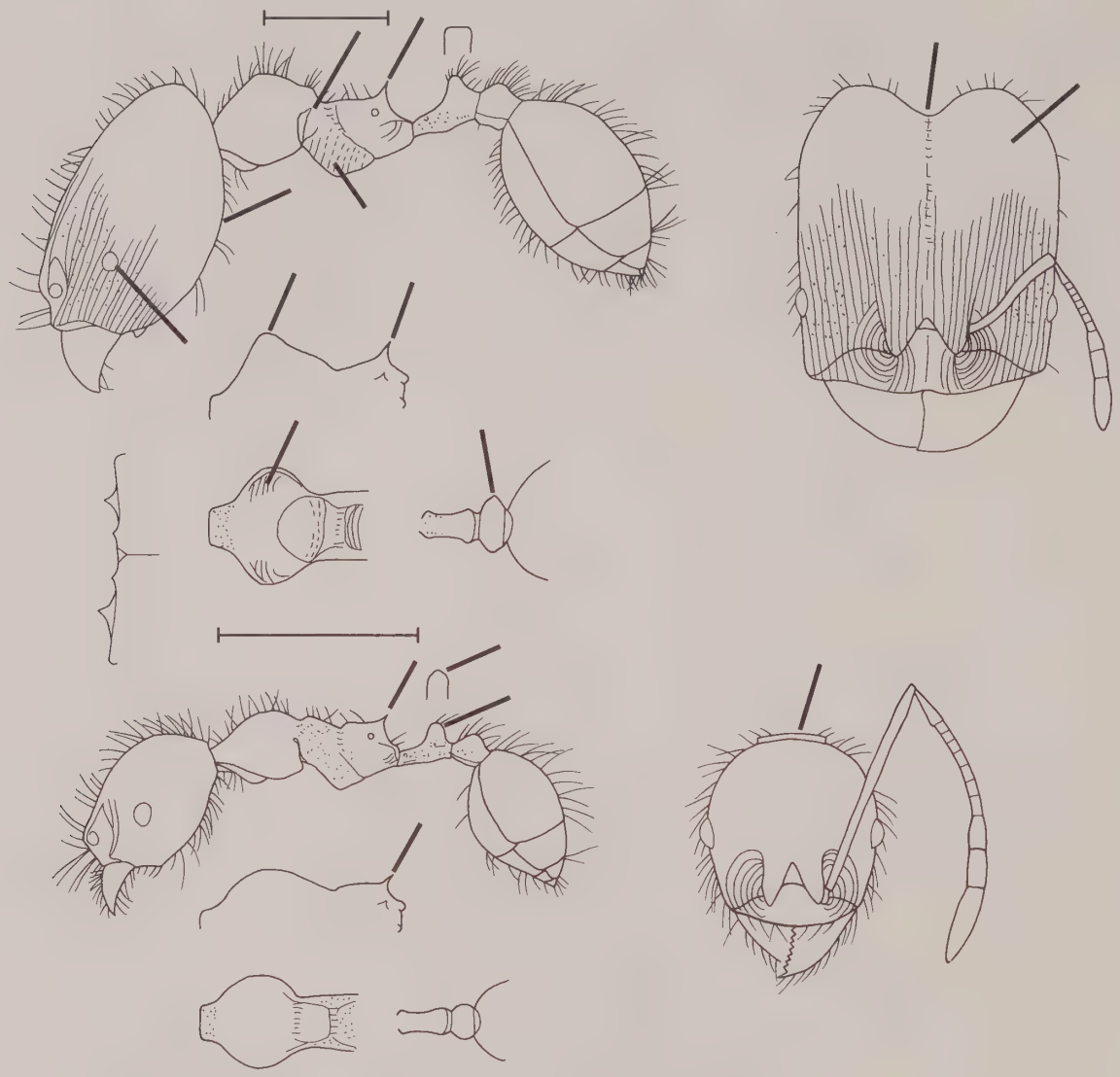


Pheidole subsphaerica **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L Gr *subsphaerica,* shaped somewhat like a ball, referring to the head of the major.
DIAGNOSIS A large, unusual species of the *tristis* group, similar to *pepo, rotundiceps,* and the dramatically unique *sphaerica* (q.v.), and distinguished as follows.
Major: head in full-face view circular, with flattened posterior dorsal margin; carinulae limited to the level of the posterior margin of the eye, those originating mesad to the eye curving downward below the eye and then back up again, as illustrated; promesonotum and head mostly smooth and shiny; postpetiole cone-shaped; all of body densely pilose.
MEASUREMENTS (mm) Holotype major: HW 2.02, HL 1.94, SL 1.18, EL 0.26, PW 0.94.
Paratype minor: HW 0.66, HL 0.42, SL 0.96, EL 0.14, PW 0.44.
COLOR Major: concolorous light reddish yellow.
Minor: concolorous clear yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with species listed in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Pueblito, on southern boundary of Tayrona Park, 250 m (Charles Kugler). Scale bars = 1 mm.



Pheidole superba **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *superba,* splendid, superior, referring to the larger, strikingly dark, shiny body of major.

DIAGNOSIS Similar in various traits to *amata, ambigua, celaena, fera, germaini, peruviana, rutilana, schwarzmaieri,* and *vomer,* differing as follows.

Major: large, dark reddish to blackish brown; eye small; humerus prominently raised in dorsal-oblique view as a large equilateral triangle; in side view, venter of head strongly convex and dorsum weakly so, with the head as a whole tapering conspicuously to the occiput; in full-face view, head subrectangular, with deep occipital cleft; posterior half of dorsal head surface smooth and shiny, anterior half carinulate, with no rugoreticulum; lower half of mesopleuron, humeri, and parts of mesonotum and propodeal dorsa carinulate, rest of mesosoma smooth and shiny; propodeal spines long and slender; postpetiole from above elliptical, with angulate margins.

Minor: yellow; occiput only slightly narrowed but with nuchal collar; apex of petiolar node strongly and broadly convex; spines short and directed backward; head and body mostly smooth and shiny.

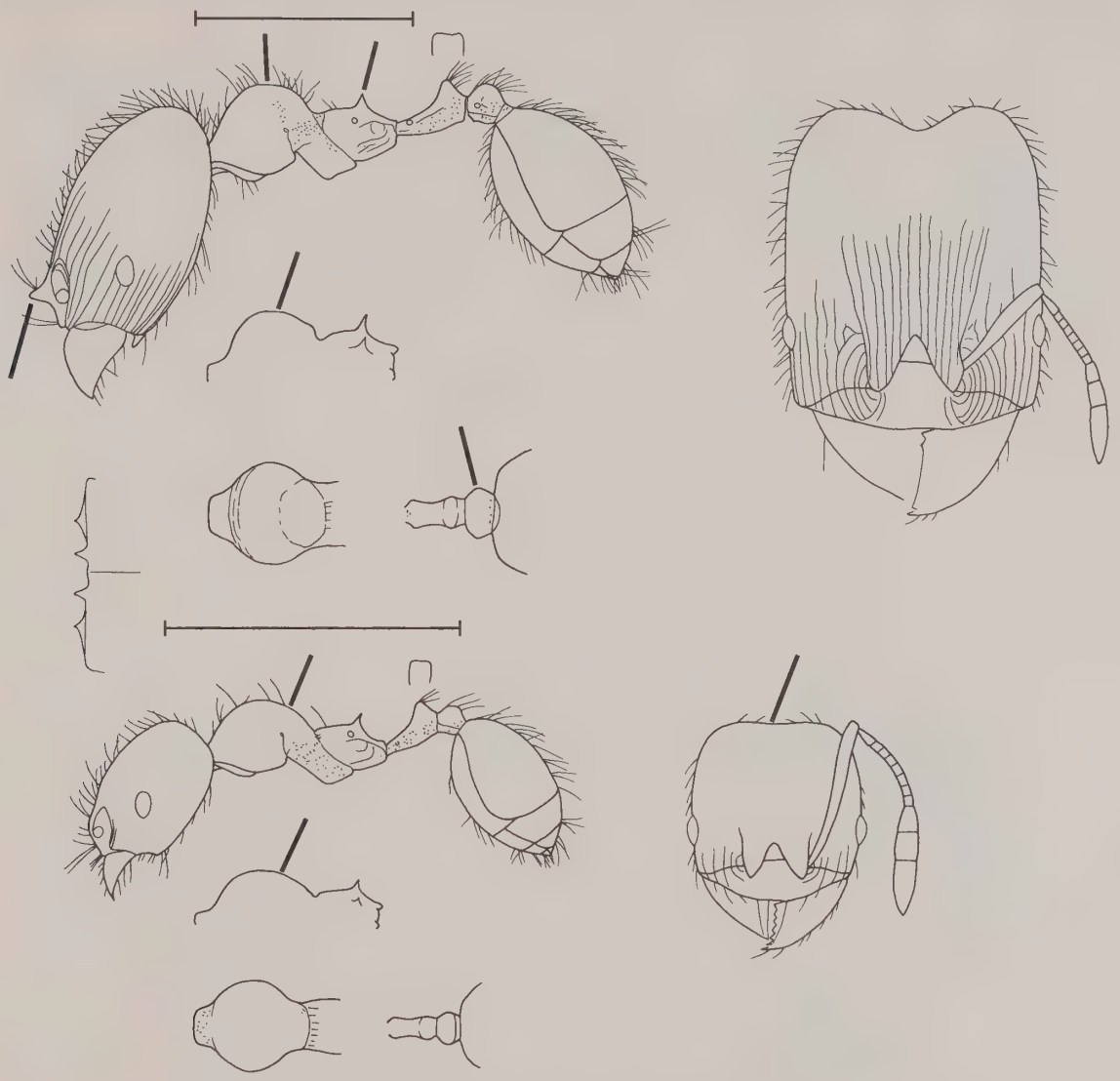
MEASUREMENTS (mm) Holotype major: HW 1.84, HL 2.16, SL 0.86, EL 0.20, PW 0.84.
Paratype minor: HW 0.62, HL 0.66, SL 0.74, EL 0.10, PW 0.40.

COLOR Major: head dark reddish brown, rest of body blackish brown, appendages medium reddish brown.
Minor: dark yellow.

RANGE Known from the type locality, as well as from Barro Colorado Island, Panama.

BIOLOGY The Barro Colorado series was collected form a bat roost (Diana E. Wheeler).

FIGURE Upper: holotype, major. Lower: paratype, minor. GUYANA: Kartabo (William M. Wheeler). Scale bars = 1 mm.

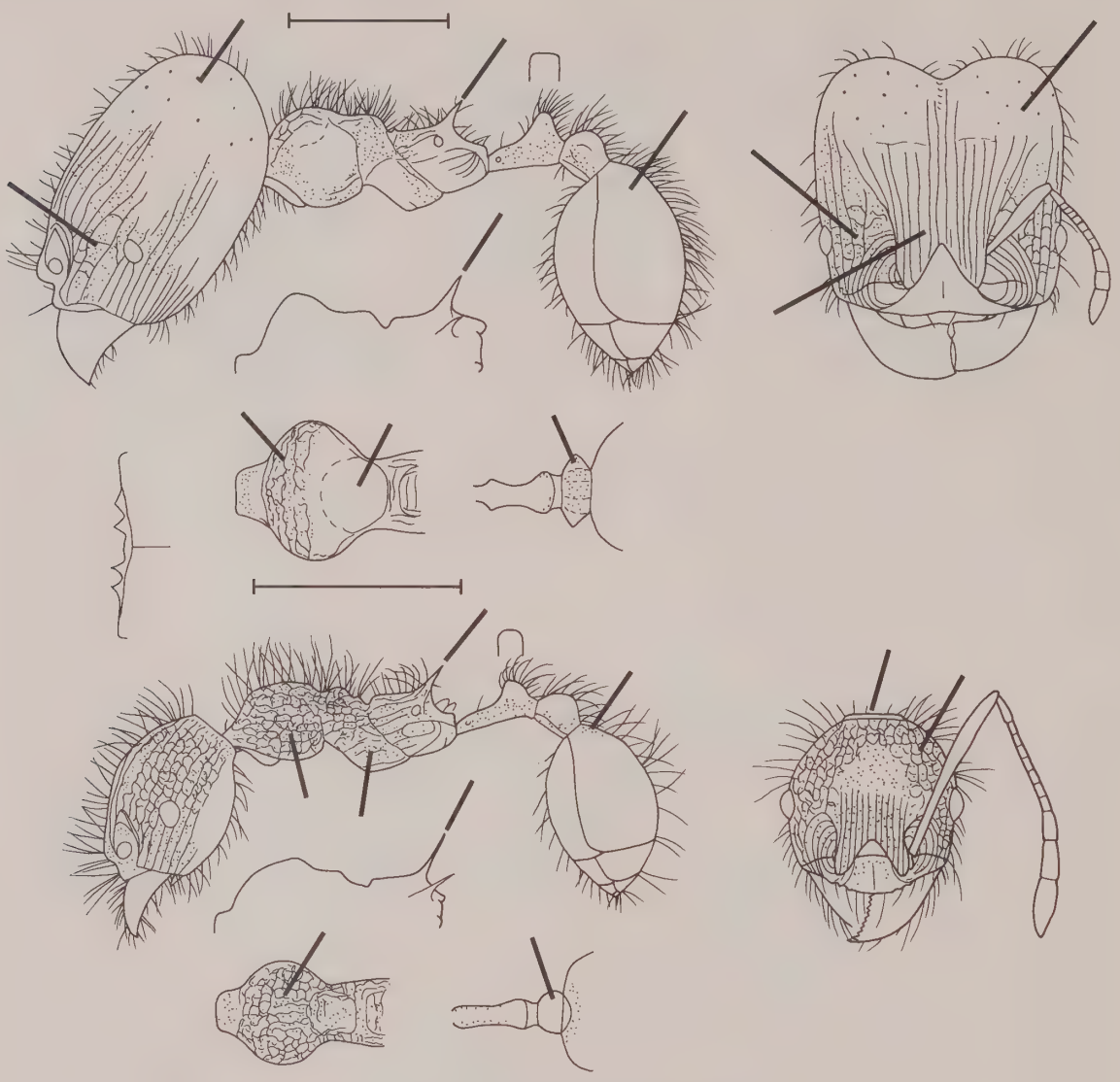


Pheidole synarmata **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Gr L *synarmata,* with the armed one, referring to other members of the *subarmata* complex.
DIAGNOSIS Similar to *allarmata, cramptoni, hasticeps, subarmata,* and *triplex,* differing from these and other *Pheidole* by the following combination of traits.
Major: head elongate; in side view, frontal lobe extending vertically off the dorsal surface of the head as a spine-like projection; promesonotum forming a large, bulbous, smoothly semicircular outline; petiolar spine well-developed and vertical; posterior half of the head capsule and almost all of the body smooth and shiny.
Minor: occiput broad and concave, lacking nuchal collar; promesonotal profile forming a prominent, smooth semicircle; except for the foveolate mesopleuron and lower side of the petiole, the body is completely smooth and shiny.
MEASUREMENTS (mm) Holotype major: HW 0.92, HL 1.14, SL 0.42, EL 0.12, PW 0.46.
Paratype minor: HW 0.46, HL 0.50, SL 0.42, EL 0.06, PW 0.30.
COLOR Major: concolorous clear medium yellow.
Minor: concolorous clear light yellow.
RANGE Known from the type locality and from Cuiabá, Mato Grosso, Brazil (J. C. Trager).
BIOLOGY Unknown.

Compare with *horribilis, minax, ursus*, *macromischoides,* and species around them

FIGURE Upper: holotype, major. Lower: paratype, minor. SURINAME: Voltzberg Camp, Raleigh-Vallen-Voltzberg Reserve, 90 m (James Carpenter and D. Trail). Scale bars = 1 mm.



Pheidole terribilis **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *terribilis,* dreadful, frightful.

DIAGNOSIS Similar in various traits to the species listed in the heading above, differing as follows.

Major: propodeal spine stout, about half as long as propodeal basal face; rear third of head smooth, with scattered foveae; a loose rugoreticulum between eye and antennal fossa on each side; frontal lobes and vertex carinulate; anterior half of promesonotum rugoreticulate, rear half smooth; postpetiolar dorsum foveolate and carinulate; gaster entirely smooth.

Minor: occiput and sides of head to level of eyes rugoreticulate; lower half of mesopleuron loosely rugose, and dorsum foveolate only, with rest of promesothorax rugoreticulate.

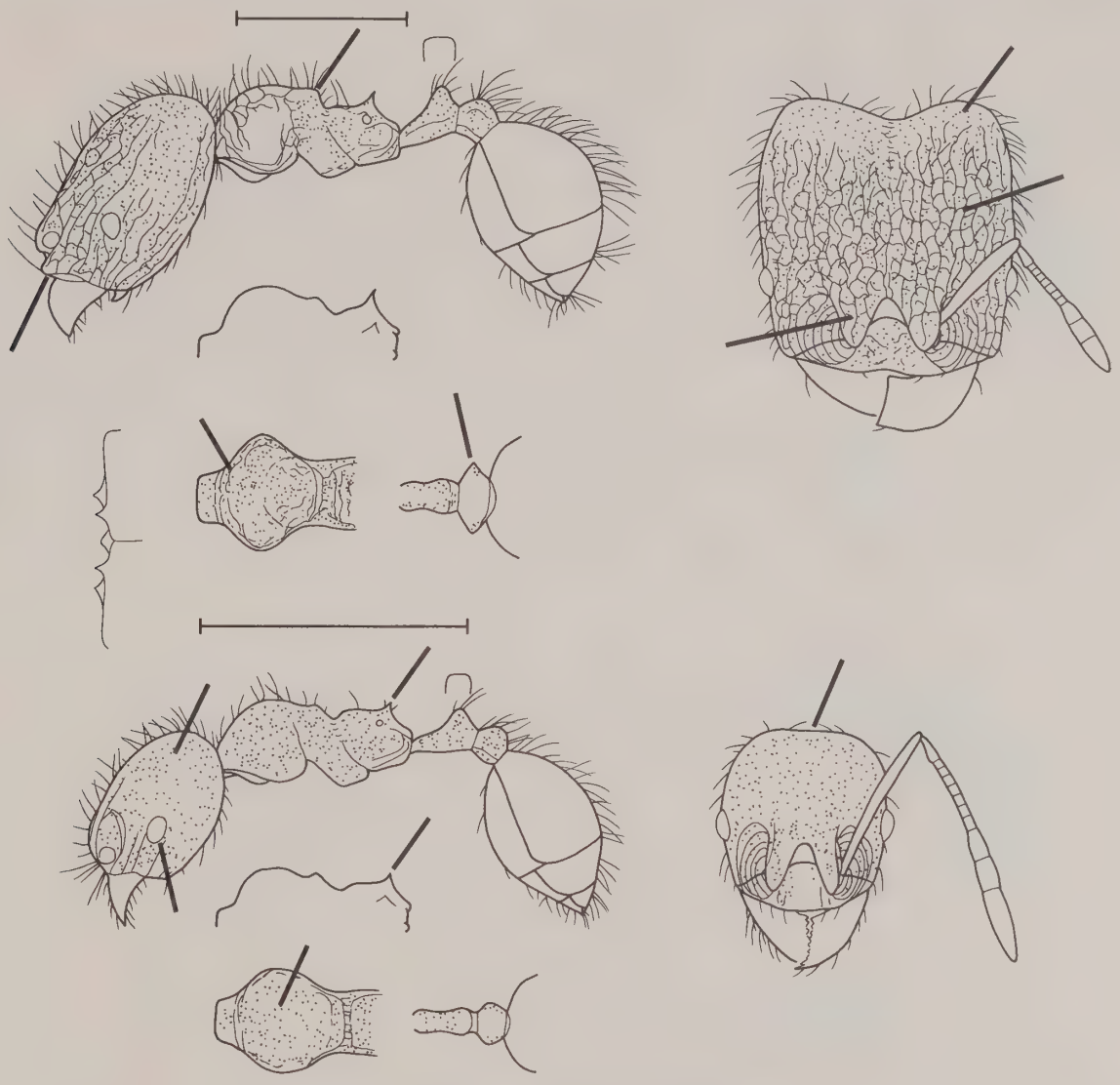
MEASUREMENTS (mm) Holotype major: HW 1.80, HL 1.86, SL 0.94, EL 0.20, PW 0.90.
Paratype minor: HW 0.76, HL 0.70, SL 0.82, EL 0.14, PW 0.50.

COLOR Major: body, antennae, mandibles medium reddish brown; legs brownish yellow.
Minor: mesosoma, waist, and appendages light to medium reddish brown; head and gaster dark reddish brown.

RANGE Known from the type locality, and 35 km south-southeast of Flor de Oro, Santa Cruz, Bolivia, 450 m (P. S. Ward).

BIOLOGY Unknown.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. ARGENTINA: San Pedro, Misiones. Scale bars = 1 mm.



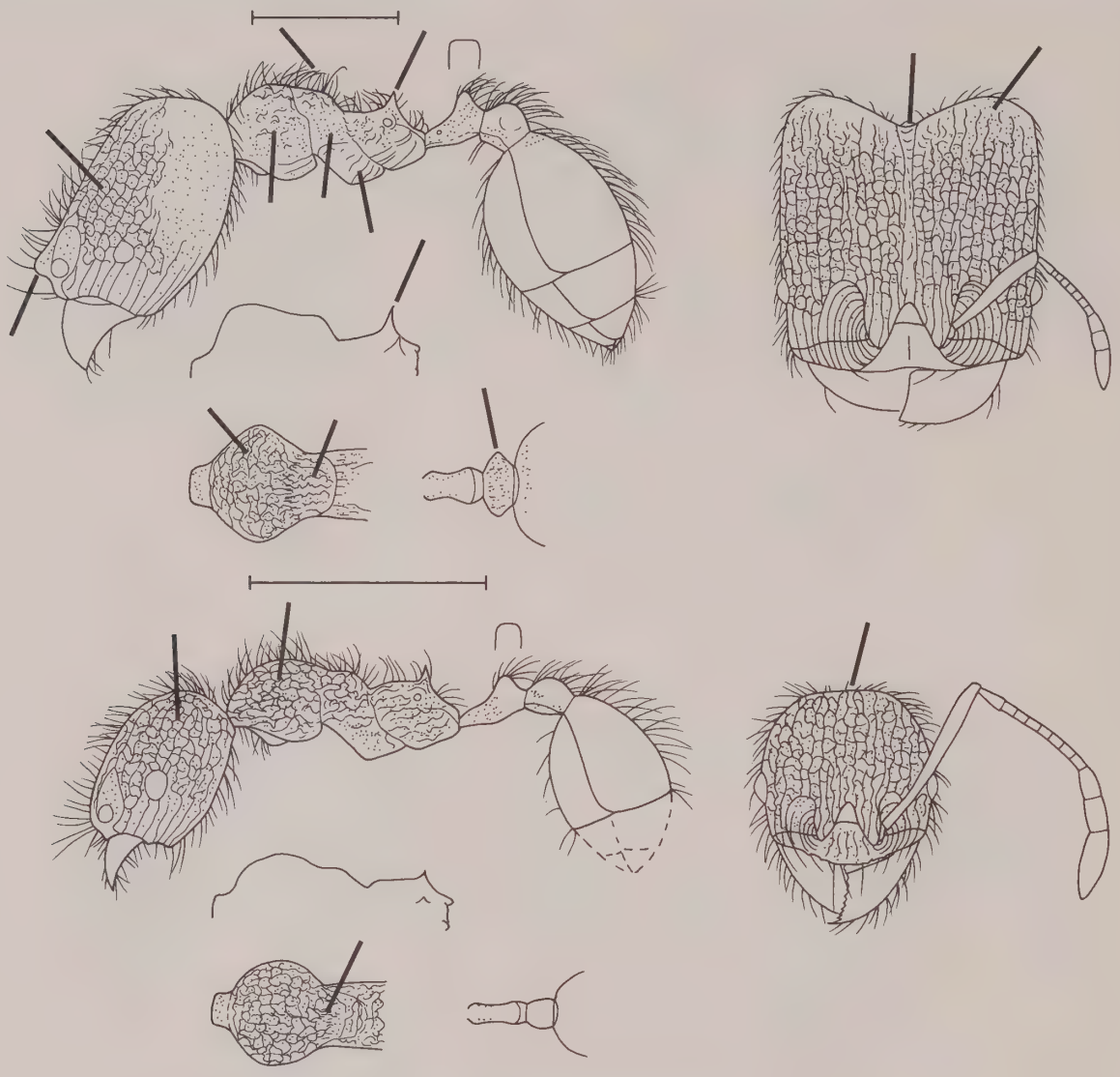
Pheidole trachyderma Emery, **new status**

Pheidole risi subsp. *trachyderma* Emery 1906c: 148.

TYPES Mus. Civ. Stor. Nat. Genova.
ETYMOLOGY Gr *trachyderma,* rough skin, alluding to rugoreticulate sculpturing.
DIAGNOSIS Similar in various traits to *aper, bambusarum, brevicona, dyctiota, laeviventris, lutzi, rugatula, senilis, sigillata,* and *traini,* distinguished as follows.
Major: reddish yellow; all of dorsal surface of head (including frontal lobes) rugoreticulate, except for occiput, antennal fossae, frontal triangle, and clypeus; margins of pronotal dorsum rugulose and humeri rugoreticulate, but rest of promesonotal dorsum almost exclusively foveolate; in side view promesonotum descends to metanotal groove in a near-vertical face; postpetiole from above cone-shaped.
Minor: all of head, mesosoma, and petiole foveolate and opaque, carinulae confined to anterior dorsal surface of head, and rugoreticula wholly lacking; occiput broad, lacking nuchal collar.
MEASUREMENTS (mm) Lectotype major: HW 1.18, HL 1.18, SL 0.64, EL 0.14, PW 0.66.
Paralectotype minor: HW 0.58, HL 0.62, SL 0.58, EL 0.10, PW 0.40.
COLOR Major: concolorous medium reddish yellow.
Minor: concolorous light reddish yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. PANAMA: Cerro Campana (William L. Brown). Scale bars = 1 mm.



Pheidole traini **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Named in honor of Russell E. Train, pioneer in the modern movement of global conservation.

DIAGNOSIS Similar in various traits to *aper, bambusarum, brevicona, dyctiota, laeviventris, lutzi, risii, rugatula, senilis, sigillata,* and *trachyderma,* differing as follows.

Major: yellow to dark reddish brown; head subrectangular, with almost perfectly straight sides in full-face view; occipital cleft deep, and occipital lobes subangular; in side view frontal lobes project well forward as conspicuous lobes; all of posterior half of dorsal head surface except for occipital margin rugoreticulate; pronotal dorsum rugoreticulate; mesonotal dorsum rugulose; most of sides of mesosoma with scattered short rugulae and carinulae; pilosity very dense, and in mesosoma much of it curved to give a woolly appearance; propodeal spines long, stout, and vertical on propodeal dorsal face.

Minor: all of posterior head surface and pronotum and dorsa of mesothorax and propodeum rugoreticulate; occiput narrowed but lacking nuchal collar.

MEASUREMENTS (mm) Holotype major: HW 1.64, HL 1.80, SL 0.66, EL 0.18, PW 0.96.
Paratype minor: HW 0.70, HL 0.70, SL 0.62, EL 0.10, PW 0.50.

COLOR Major: concolorous medium reddish yellow (types) or dark reddish brown (Costa Rica: San Vito).
Minor: head and mesosoma medium reddish yellow, with waist, gaster, and appendages medium yellow (types) to dark reddish brown (Costa Rica: San Vito).

RANGE In addition to the type locality, this species has been reported by Longino (1997) in Costa Rica on the southern Pacific slope.

BIOLOGY According to Longino (1997), *traini* occurs in Costa Rica in mature wet forests. Its nesting and feeding habits are unknown.

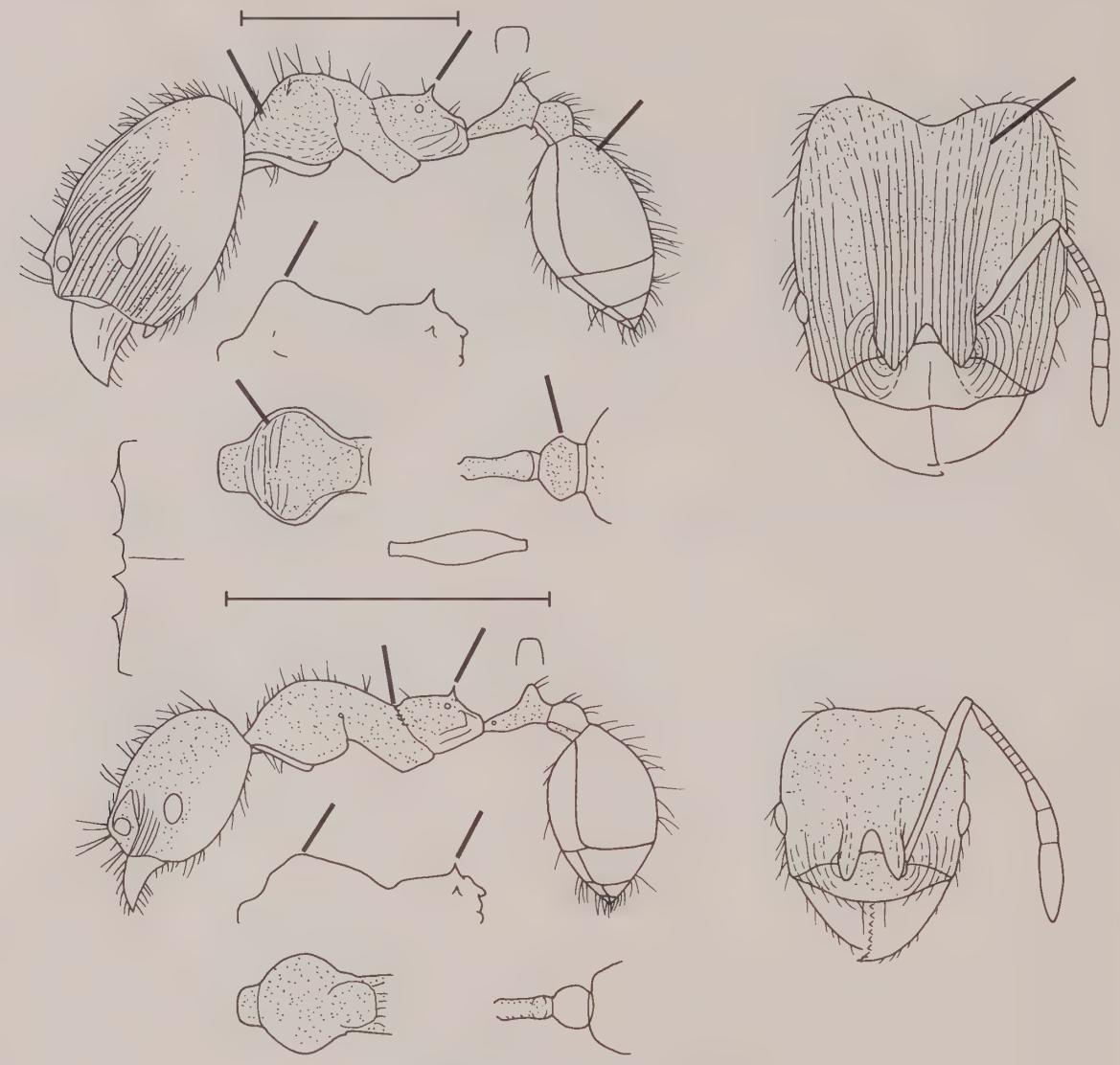
TYPE LOCALITY TRINIDAD: Aripo Ridge, Arima Valley, 550–650 m (Stefan Cover and Mark W. Moffett).

[Not figured]

Pheidole triplex **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *triplex,* three parts, referring to the tricolorous condition of the major.
DIAGNOSIS **Major**: virtually identical with *subarmata* **major** except for its much smaller size (HW about 0.8 mm versus more than 0.9 mm in *subarmata*) and strikingly different color (see below). Stefan Cover, who has examined this species and *subarmata* in detail, reports that the head of the *triplex* **major** is also slightly narrower.
Minor: virtually identical with *subarmata* **minor** except for its strikingly different color (see below). Another possible difference is habitat: the *triplex* types were collected in mature mountain rainforest, while *subarmata* prefers open, even disturbed habitats.
MEASUREMENTS (mm) Holotype major: HW 0.80, HL 1.06, SL 0.44, EL 0.12, PW 0.46.
Paratype minor: HW 0.42, HL 0.46, SL 0.42, EL 0.09, PW 0.28.
COLOR Major: strongly tricolorous, with head and mandibles uniformly medium brown; mesosoma, waist, and appendages yellow; and gaster light brown.
Minor: concolorous clear light yellow.
RANGE Known only from the type locality.
BIOLOGY The type colony was found in mature montane rainforest, nesting beneath a rock in clay soil. A seed cache was present.

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Cuzco Amazónico, 15 km northeast of Puerto Maldonado, Tambopata (Stefan Cover and John E. Tobin). Scale bars = 1 mm.



Pheidole tristicula **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *tristicula,* dim. of *tristis,* sad.

DIAGNOSIS A small, bicolorous, mostly yellow species belonging to a group of ambiguous species composing the "*carapuna* complex" *(boltoni, carapuna, cornicula, cuprina, eriophora, jivaro, manuana,* and *tristicula)*. All are relatively small in size, with the **major** possessing a reduced mesonotal convexity and cephalic sculpturing that consists entirely of longitudinal carinulae that extend to or almost to the occipital border seen in full-face view. All also have a **minor** with a broad, concave occiput, which lacks a collar. Among these species, *P. tristicula* is distinguished in the **major** by combination of its elevated humerus in dorsal-oblique view, laterally angular postpetiolar node, transversely carinulate pronotal dorsum, partially shagreened first gastral tergite, and in color. It is closest to *carapuna*.

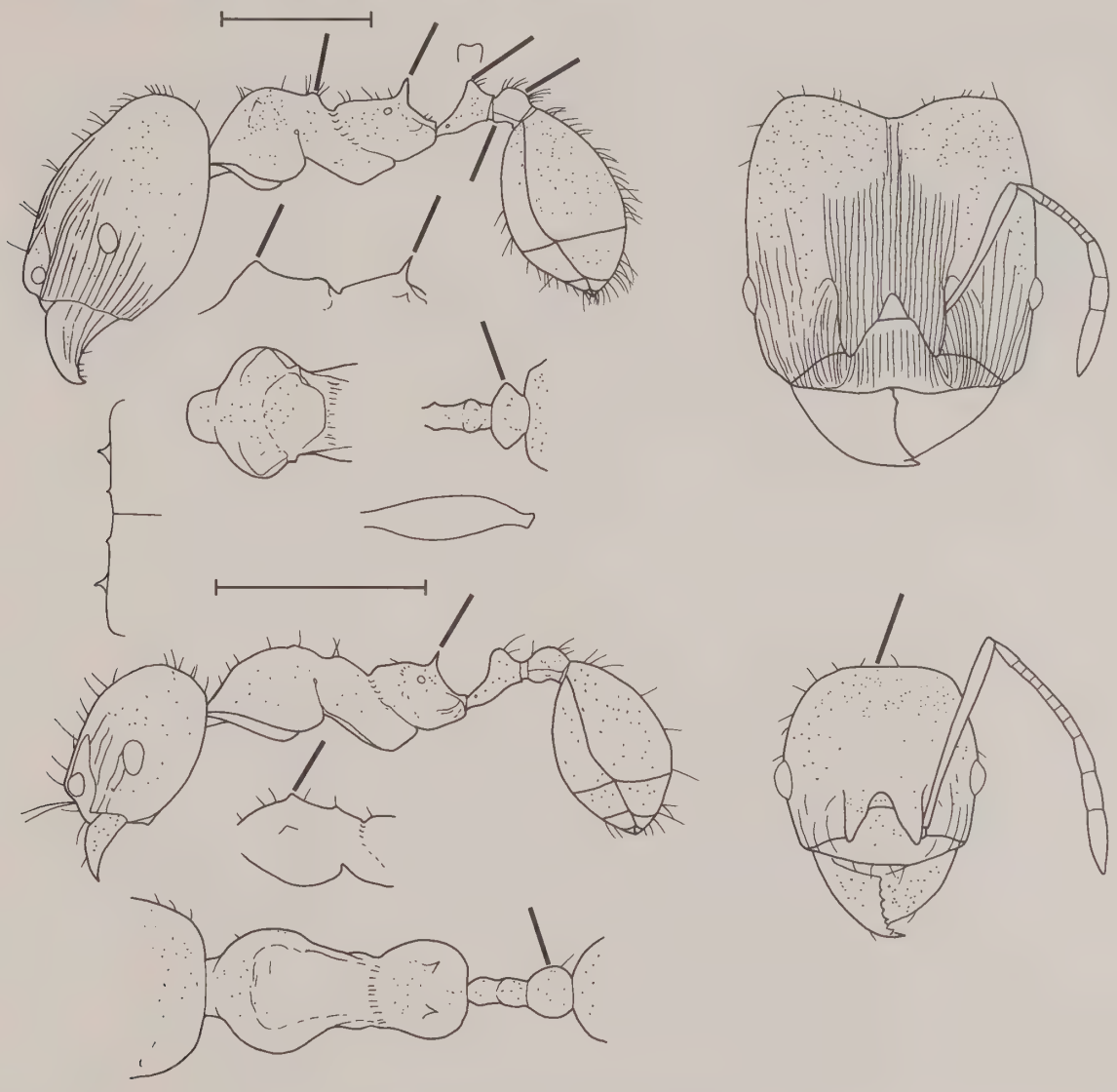
MEASUREMENTS (mm) Holotype major: HW 1.08, HL 1.24, SL 0.64, EL 0.18, PW 0.60.
Paratype minor: HW 0.56, HL 0.60, SL 0.54, EL 0.12, PW 0.38.

COLOR Major and minor: head and mesosoma light reddish yellow ("orange"), rest of body and appendages clear medium yellow.

RANGE A very widespread but overall not abundant species. I have identified series from Veracruz, Mexico; Honduras; Colombia; French Guiana; Trinidad; and scattered localities in Amazonian Brazil, Ecuador, Peru, and Bolivia.

BIOLOGY At Cuzco Amazónico, near Puerto Maldonado, Peru, Stefan Cover and John E. Tobin found a colony in mature rainforest, nesting in humus on top of a rotten log. Similarly, Mark Moffett collected a colony from a rotten log at Saul, French Guiana.

FIGURE Upper: major (Boraceia Biological Station, Mun. Salesópolis, São Paulo state, Brazil, William L. Brown), associated with minors compared by E. O. Wilson with holotype minor from Tijuca, Rio de Janeiro, Brazil. At the bottom the right hind femur is depicted. Lower: holotype, minor (from Tijuca, Brazil). Scale bars = 1 mm.



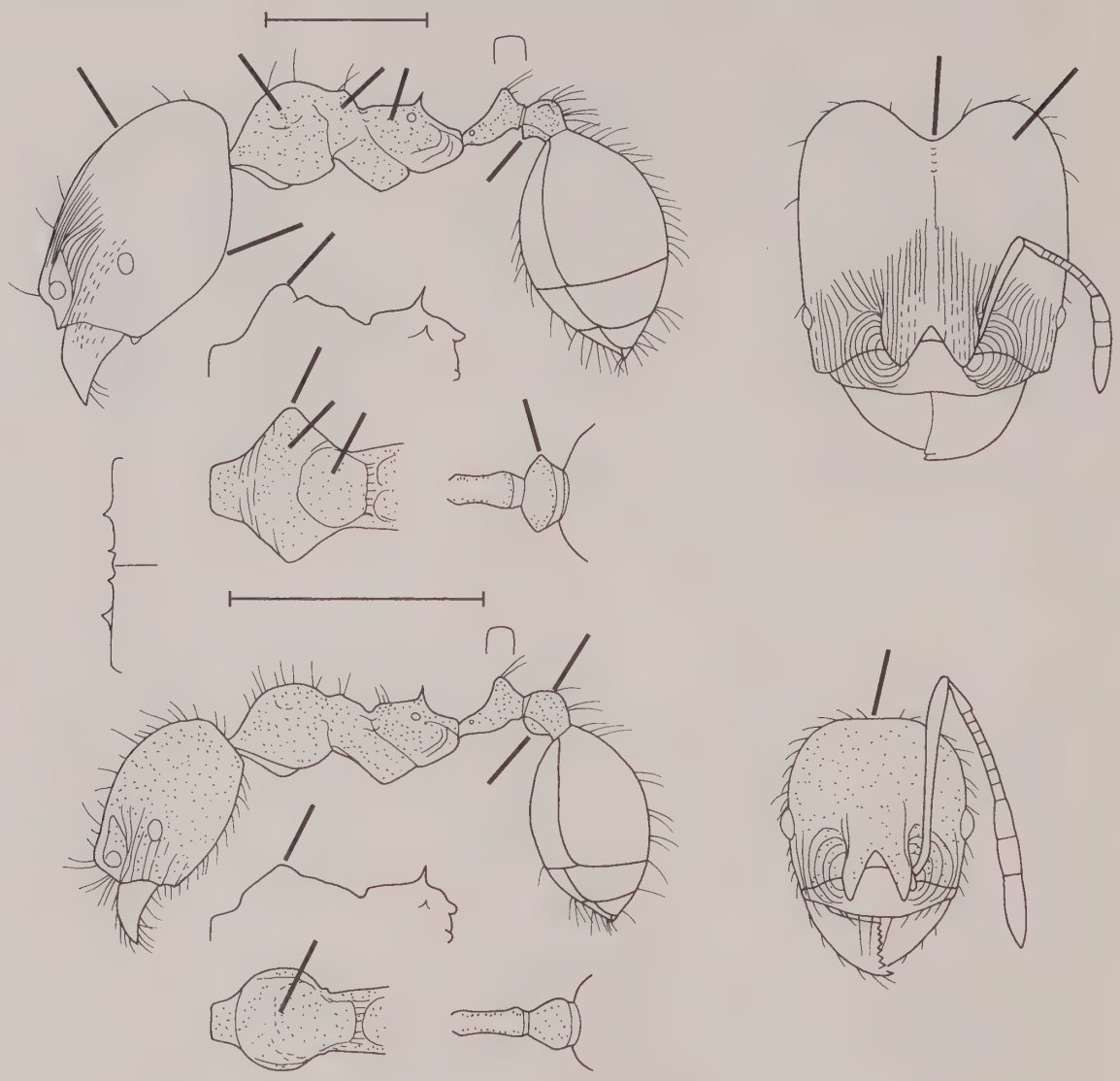
Pheidole tristis (F. Smith)

Myrmica tristis F. Smith 1858a: 132, combination to *Pheidole* by Mayr 1886c: 360. Syn.: *Atta rubra* F. Smith 1858a: 168, combination to *Pheidole* by Mayr 1886c: 360 and synonymy by Kempf 1965: 183; *Pheidole emeryi* Mayr 1887: 589, synonymy by Kempf 1965: 183; *Pheidole crassipes* Mayr 1887: 590, 600, n. syn.; *Pheidole emeryi* var. *alsia* Santschi 1923d: 58, n. syn.

TYPES Nat. Hist. Mus. London.
ETYMOLOGY L *tristis,* sad, allusion unknown.
DIAGNOSIS A medium-sized reddish-yellow (**major**) or yellowish brown (**minor**) member of the *tristis* group whose **major** has very prominent subangulate pronotal humerus, swollen hind femora, diamond-shaped postpetiolar node with subangulate margins, small rounded subpostpetiolar process, and foveolate and opaque gastral tergite.
Minor: large ovoid postpetiolar node, prominent convex subpostpetiolar process, and foveolate and opaque gastral tergites.
Similar to *balzani, fabricator*, and *nigella*, and less so to *brunnescens, exarata, excubitor, germaini, grandinodus, hispaniolae, grantae, obrima, prattorum, rogeri, sabina, sarpedon, stulta, tristops, unicornis,* and *zoster,* differing in many details of body form, sculpturing, and pilosity, as illustrated, and in color.
MEASUREMENTS (mm) Major (Boraceia Biological Station, São Paulo state): HW 1.66, HL 1.76, SL 0.82, EL 0.20, PW 0.84.
Holotype minor: HW 0.80, HL 0.84, SL 0.84, EL 0.12, PW 0.52.
COLOR Major: body and appendages clear light reddish yellow ("orange"), with gaster a shade darker.
Minor: concolorous medium yellow brown, in both the Boraceia Biological Station series and holotype minor.
RANGE Kempf (1972b): southeastern Brazil (Santa Catarina, São Paulo, Rio de Janeiro, Paraná) and north central Argentina (Misiones).
BIOLOGY Unknown.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: 2–3 km above Minca, Magdalena, 650–950 m (William L. Brown). Scale bars = 1 mm.



Pheidole tristops **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr L *tristops,* like *tristis*.

DIAGNOSIS Similar in various ways to *balzani, brunnescens, exarata, excubitor, fabricator, germaini, hispaniolae, nigella, prattorum, sabina, sarpedon, unicornis,* and especially *tristis,* differing as follows.

Major: head in side view with strongly convex ventral profile and weakly convex dorsal profile, the whole tapering strongly to the occiput; occipital cleft deep; humeri lobate, seen from above extending over the rest of the pronotum and from the side raised to a prominent discrete lobe; anterior half of postpetiolar venter in side view bearing an acute-angular process; postpetiolar node from above cone-shaped; all of mesosoma and waist foveolate and opaque.

Minor: occiput broad, lacking nuchal collar; humerus in dorsal-oblique view raised and subangulate; postpetiolar venter in side view strongly convex; all of body except gaster foveolate and opaque.

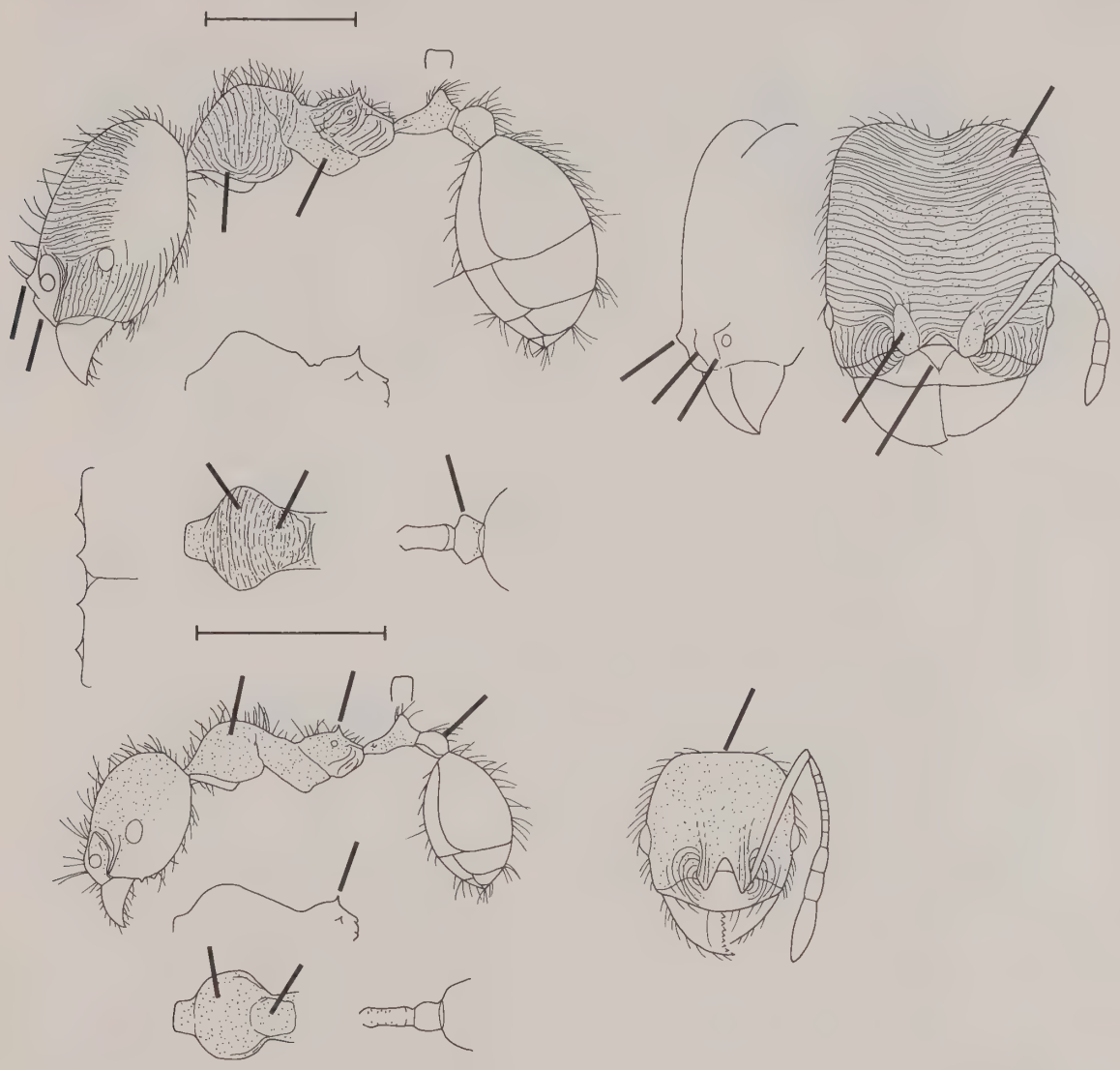
MEASUREMENTS (mm) Holotype major: HW 1.74, HL 1.86, SL 0.82, EL 0.14, PW 0.82.
Paratype minor: HW 0.66, HL 0.74, SL 0.76, EL 0.10, PW 0.42.

COLOR Major: body and mandibles medium reddish brown; legs and antennae brownish yellow.
Minor: head, mesosoma, and petiole medium brown; antennae, mandibles, postpetiole and gaster light brown; legs dark yellow.

RANGE Known from the type locality, and from Quebrado, Chirihara, Cundinamarca, Colombia, at 1400 m (William L. and Doris E. Brown).

BIOLOGY The type colony was found in rainforest.

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: 3 km west of Fortín De Las Flores, Veracruz, 1000 m (R. J. and A. B. Hamton). Scale bars = 1 mm.



Pheidole triumbonata **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *triumbonata,* three knobs, referring to the protuberant frontal lobes and midclypeal carina.

DIAGNOSIS Similar to *arietans* and *glyphoderma* of Costa Rica in many traits, but distinguished from them and all other *Pheidole* as follows.

Major: entire dorsal surface of head from level of eyes to occiput covered by transverse carinulae; from eye level to anterior border of head the carinulae are longitudinal; there is no rugoreticulum; frontal lobes and midclypeus bare; frontal lobes and mid-carina of clypeus protrude in side view as angular processes; all of mesosoma carinulate except mesopleuron, which is solely foveolate; postpetiole cone-shaped.

Minor: dorsal surface of head and all of mesosoma foveolate; postpetiolar node greatly depressed; propodeal spines reduced to denticles; head broad, lacking nuchal collar.

MEASUREMENTS (mm) Holotype major: HW 1.40, HL 1.58, SL 0.74, EL 0.20, PW 0.74.
Paratype minor: HW 0.70, HL 0.74, SL 0.66, EL 0.12, PW 0.42.

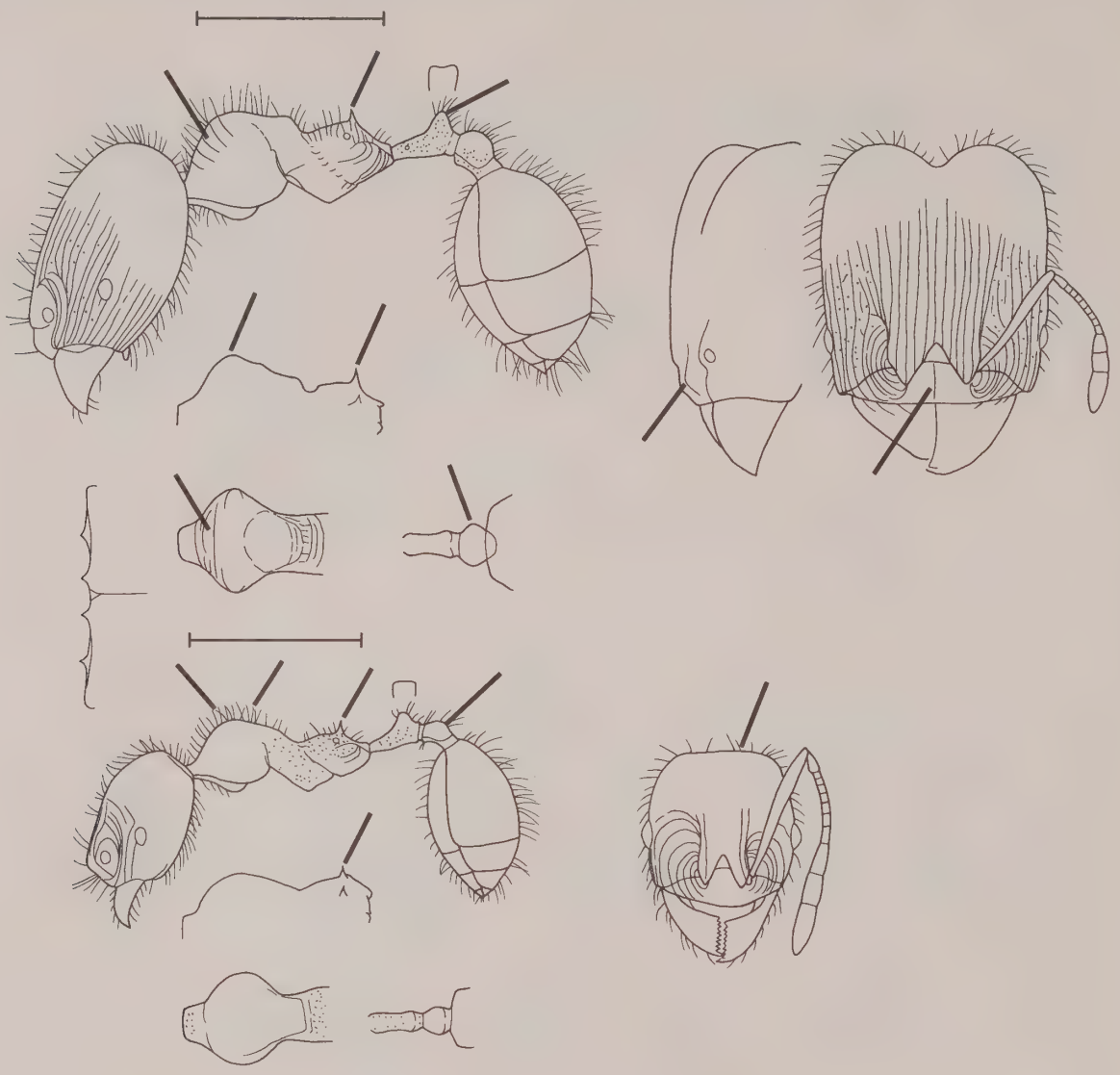
COLOR Major and minor: body dark brown; appendages light brown except for tarsi, which are yellow.

RANGE Known only from the type locality.

BIOLOGY Unknown.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Television Tower Road, Salidito, near Cali, 2100 m (W. L. Brown and R. B. Root). Scale bars = 1 mm.



Pheidole unicornis **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *unicornis,* one-horned, referring to the raised clypeal carina.

DIAGNOSIS Similar to *binasifer, diabolus, gravida, mirabilis, moseni, mosenopsis, nasifer,* and *rhinoceros,* and distinguished as follows.

Major: median carina of clypeus raised as a low, forward-projecting lobe; humerus in dorsal-oblique view a low lobe; mesonotal convexity suppressed; propodeal spines vertical on propodeal basal face, and in dorsal-oblique view curve slightly forward; dorsum of propodeum and anterior and lateral margins of pronotal dorsum carinulate; petiolar node in side view symmetrically rounded; postpetiole from above diamond-shaped.

Minor: occiput broad, lacking nuchal collar; posterior half of dorsal head surface smooth and shiny, and anterior half covered mostly by circular carinulae; propodeal spines vertical on propodeal dorsal face; postpetiolar node in side view suppressed; mesosomal pilosity consists of relatively short, erect bristles of nearly equal length.

MEASUREMENTS (mm) Holotype major: HW 1.42, HL 1.64, SL 0.72, EL 0.18, PW 0.84.
Paratype minor: HW 0.72, HL 0.78, SL 0.64, EL 0.12, PW 0.46.

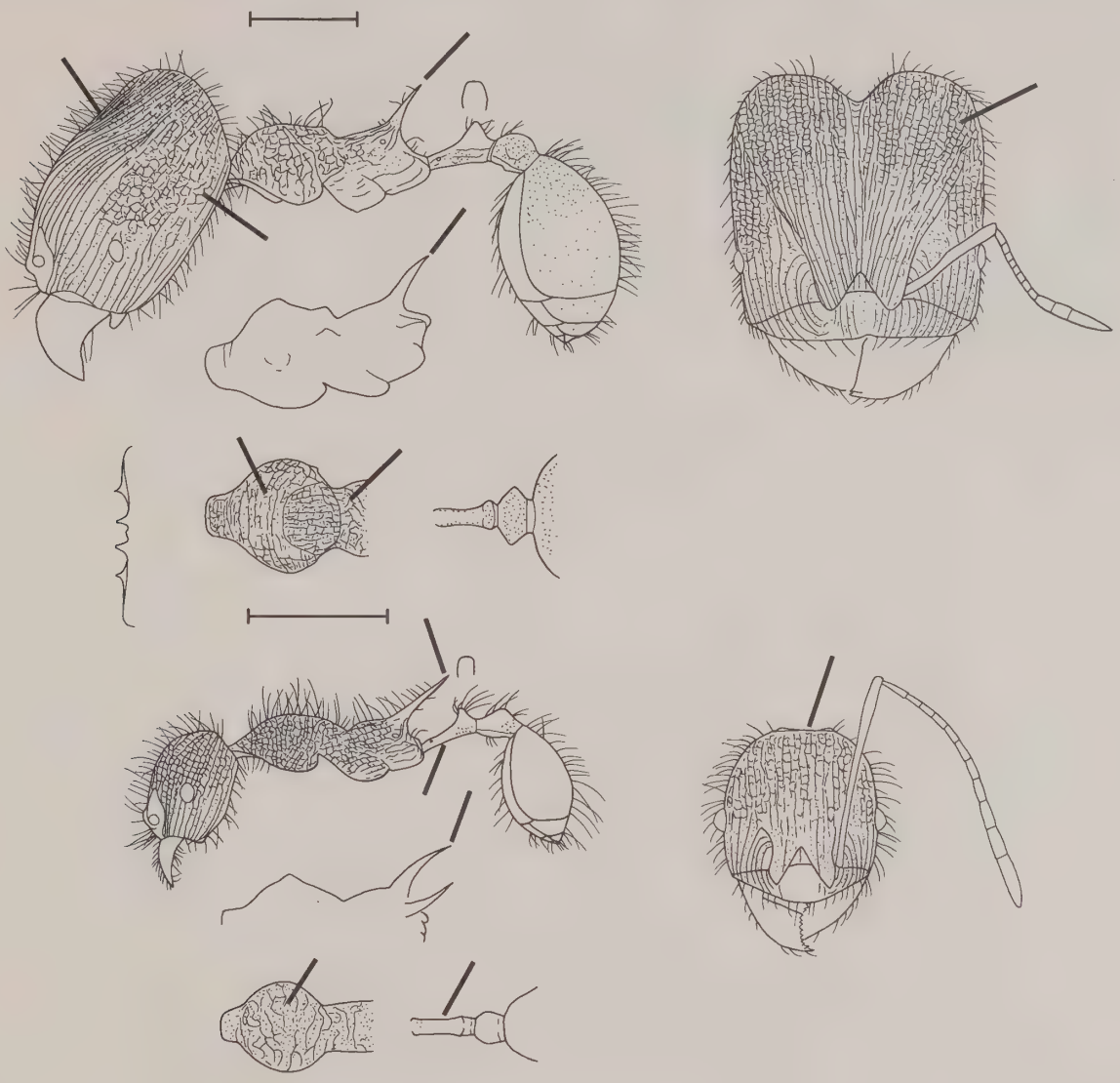
COLOR Major: head medium reddish brown, mandibles and body dark reddish brown; other appendages light reddish brown.
Minor: body medium reddish brown, appendages dark yellow.

RANGE Known from the type locality, as well as Pichindé, also near Cali, at 1600 m; and near Cochancay, on Guayaquil-Tambo Highway, Cañar, Ecuador.

BIOLOGY Occurs in mountain forests.

Compare with *horribilis, minax, terribilis, macromischoides,* and species around them

FIGURE Upper: syntype, major. Mexico, no further locality (collected by "Prof. Bilimek"). Lower: minor. MEXICO: Santa Teoviscocla, near Cuichapa, Veracruz, 1600 m (Cornell University Mexico Field Party, August 1960). Scale bars = 1 mm.

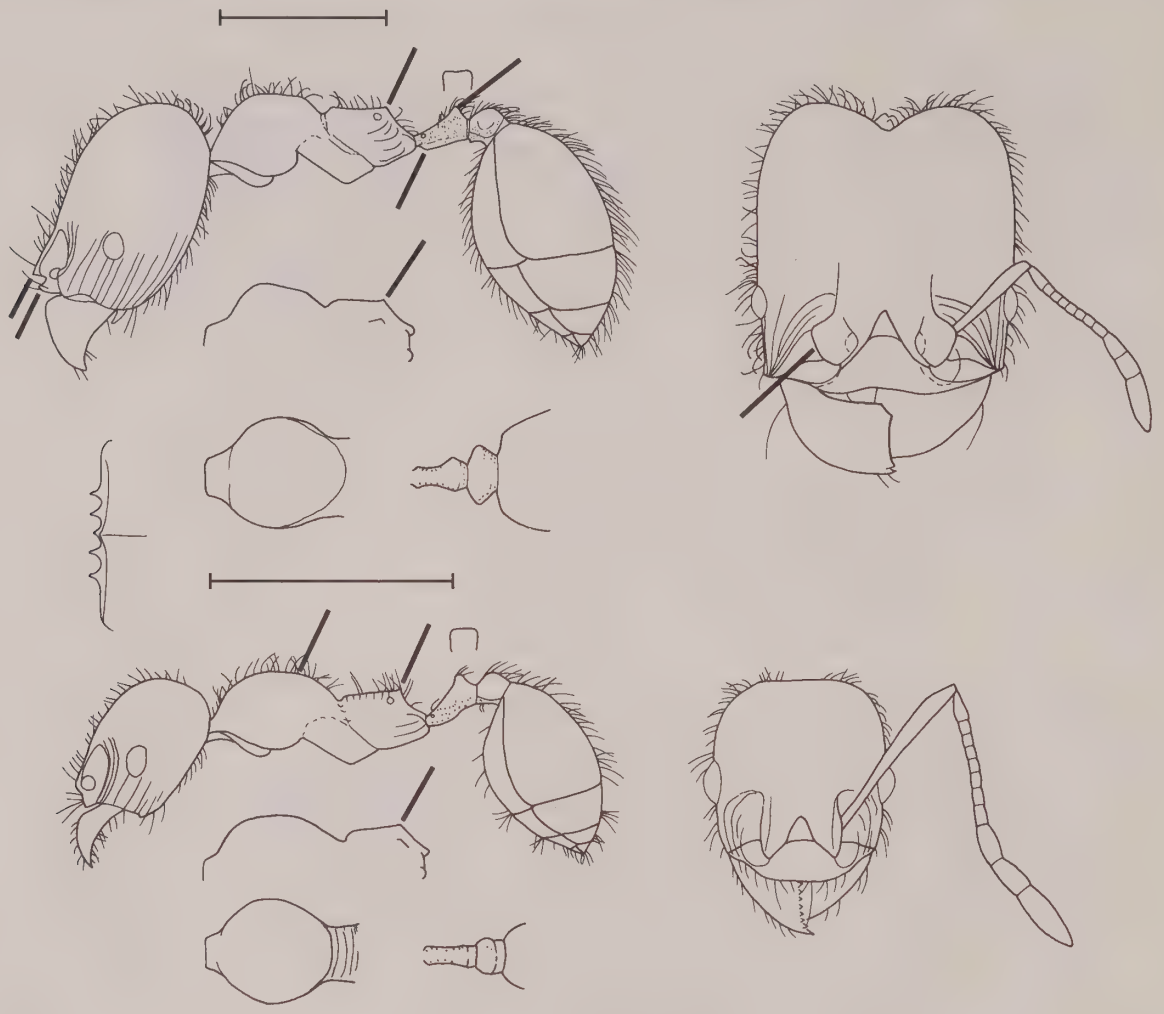


Pheidole ursus Mayr

Pheidole ursus Mayr 1870b: 986. Syn.: *Macromischa cressoni* André 1887, synonymy by Brown 1981: 528; *Pheidole ursus* var. *gracilinoda* Forel 1904e: 172, synonymy by Brown 1981: 528.

TYPES Naturhist. Mus. Wien; Mus. Comp. Zool. Harvard.
ETYMOLOGY L *ursus,* bear, undoubtedly alluding to the large, rough-surface properties and dark color of the major.
DIAGNOSIS A very large, unique species similar in various traits to the species listed in the heading above.
Major: very long propodeal spine, largely rugoreticulate surface of the mesosoma and dorsal surface of the head, shallowly concave profile of the posterior half of the head in side view, completely foveolate and opaque surfaces of the gastral tergites.
Minor: extremely long propodeal spine and petiolar peduncle, rugoreticulate promesonotum, and somewhat narrowed occiput with a thin nuchal collar.
MEASUREMENTS (mm) Syntype major: HW 2.64, HL 2.54, SL 1.22, EL 0.26, PW 1.02.
Minor: HW 0.88, HL 0.86, SL 1.00, EL 0.18, PW 0.60.
COLOR Major: body and appendages dark to blackish brown.
Minor: body concolorous blackish brown with reddish overtones; appendages, including mandibles, a lighter shade of medium reddish brown; tarsi yellowish brown.
RANGE In addition to the types (from "Mexico") I have seen a minor worker from near Cuichapa, Veracruz, collected at 1600 m.
BIOLOGY The Teoviscocla minor worker figured was collected in tropical forest with plantings of coffee.

FIGURE Upper: major (Palmar Sur, Puntarenas, Costa Rica), compared with syntype in Forel Collection. Lower: syntype, minor (San Antonio, Sierra Nevada de Santa Marta, Colombia, over 1000 m). Scale bars = 1 mm.

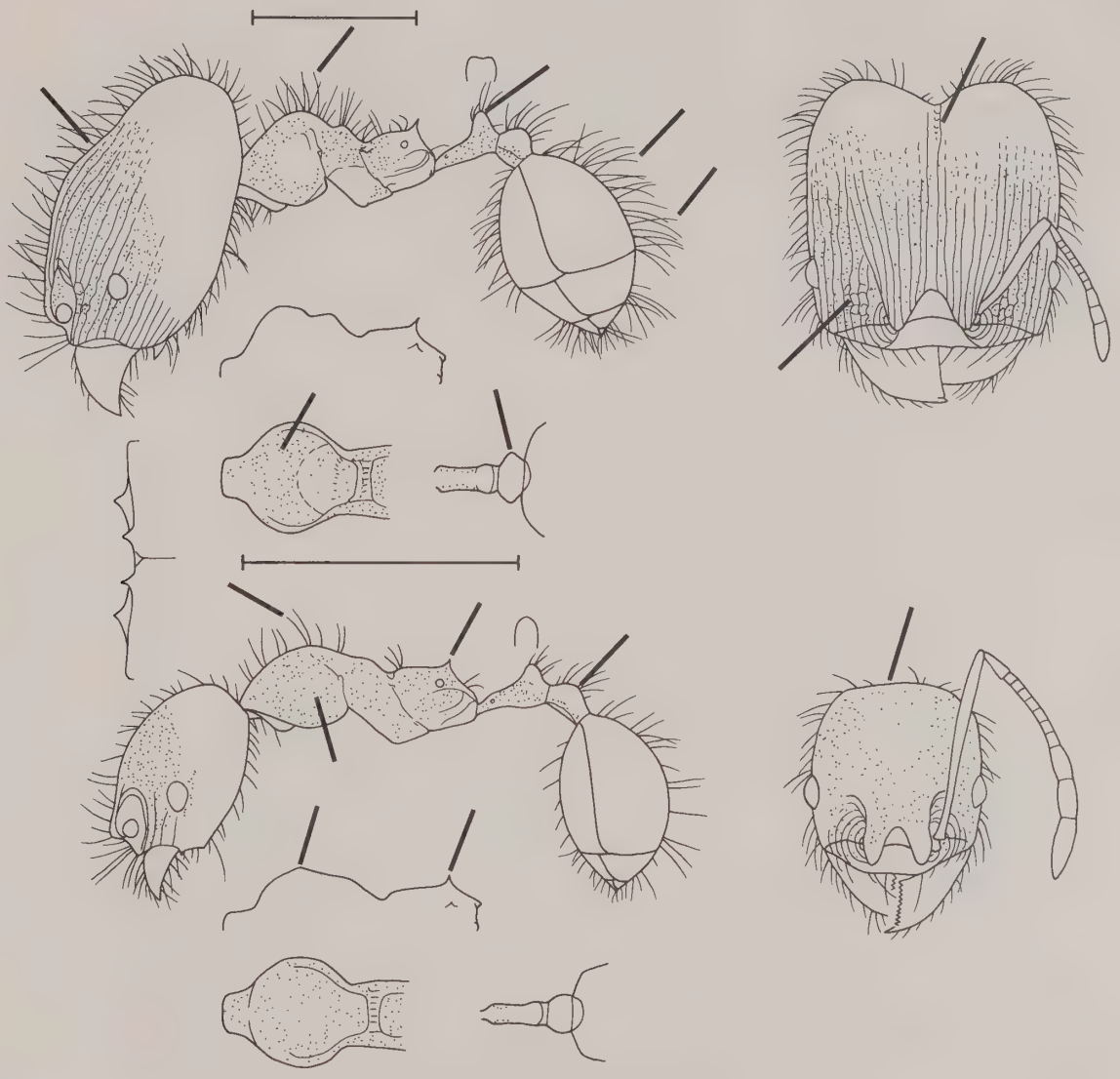


Pheidole vallifica Forel

Pheidole vallifica Forel 1901j: 357.

TYPES Mus. Hist. Nat. Genève.
ETYMOLOGY L *vallifica,* of a valley, allusion uncertain.
DIAGNOSIS An unusual member of the *tristis* group, of uncertain affinity.
Major: frontal lobes in full-face view square, turned obliquely outward; from the side the lobes project as an acute angle, as does the clypeus beneath them; carinulae limited to head at eye level and anterior to it, and body is otherwise almost completely smooth and shiny; propodeal spines reduced to oblique angles; postpetiole conulate.
Minor: basal face of propodeum and dorsal surface of head from eyes forward carinulate, and rest of body almost completely smooth and shiny; propodeal spines reduced to right angles.
MEASUREMENTS (mm) Syntype major: HW 1.12, HL 1.22, SL 0.60, EL 0.18, PW 0.60.
Syntype minor: HW 0.60, HL 0.66, SL 0.58, EL 0.12, PW 0.42.
COLOR Major (Palmar Sur, Costa Rica): light reddish brown, appendages yellowish brown.
Minor: plain light brown, appendages brownish yellow.
RANGE Honduras, Costa Rica, Colombia, Brazil (Mato Grosso), and Paraguay (Amambay).
BIOLOGY In 1896, Auguste Forel (1901j) found colonies of this "singulière espèce, une des plus curieuses du genre," at San Antonio, Colombia, in humid, sandy soil at the edge of a small stream. The small nests, which had few minors and only one or two majors, had small entrances abutted by semicircular piles of excavated soil. I found *vallifica* common in a banana plantation at Palmar Sur, at the base of Costa Rica's Osa Peninsula, where colonies nested in open soil.

FIGURE Upper: holotype, major. Lower: paratype, minor. MEXICO: 6 km south of San Cristobal de Las Casas, 2200 m (John E. Rawlings). Scale bars = 1 mm.

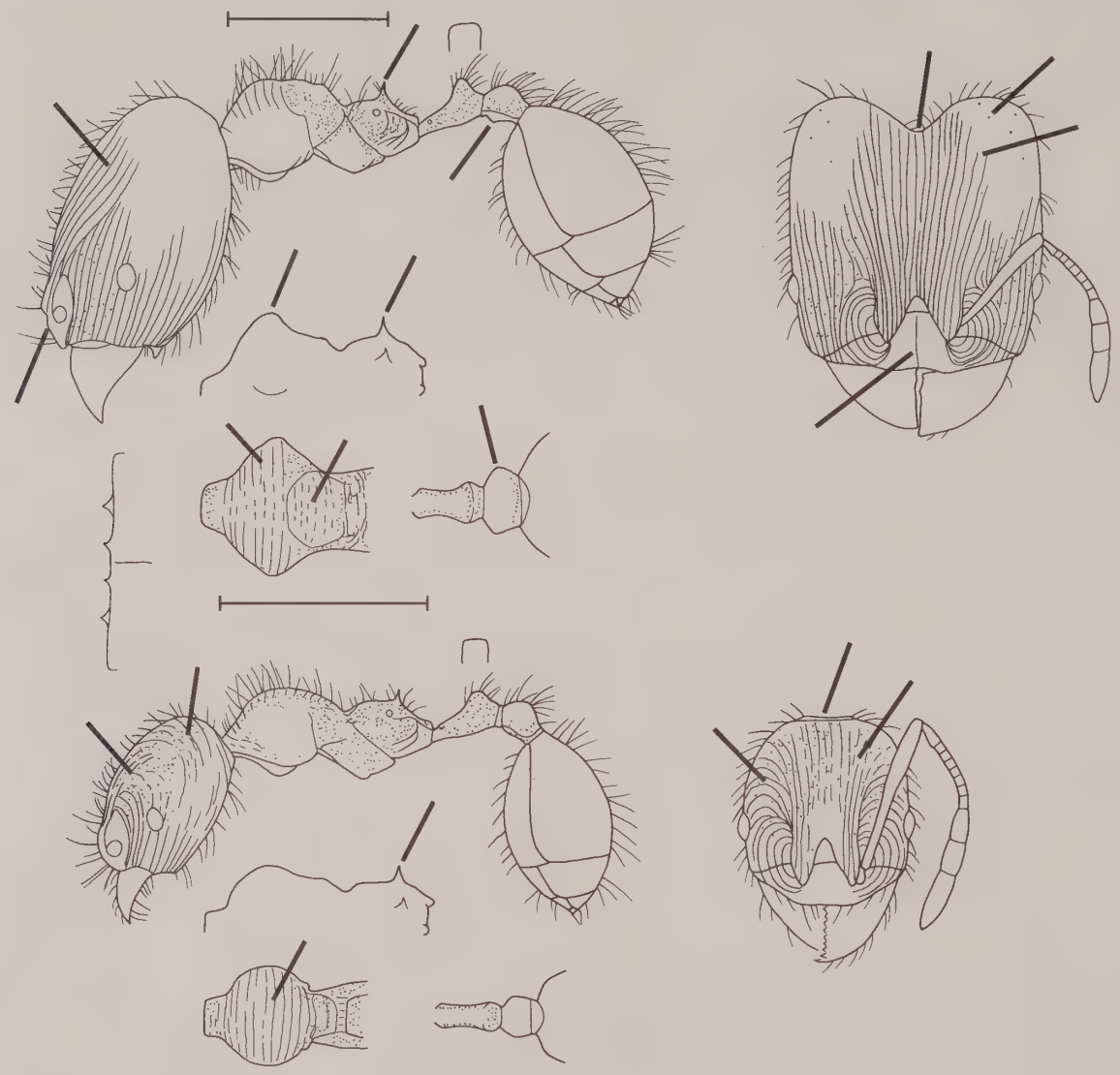


Pheidole variceps **new species**

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY L *variceps,* bent head (of major).
DIAGNOSIS A very distinctive member placed tentatively in the *tristis* group.
Major: posterior half of dorsal head profile concave; pilosity very dense and long, with many hairs 2× Eye Length; occiput mostly smooth, and rest of head mostly carinulate, with carinulae adjacent to head midline reaching occipital border; a patch of rugoreticulum present posterior to each antennal fossa; mesosomal dorsum foveolate and opaque; postpetiole from above diamond-shaped.
Minor: occiput broad, lacking nuchal collar; humeri in dorsal-oblique view subangulate; dorsal head surface and all of mesosoma foveolate and opaque; postpetiolar node suppressed; propodeal spines reduced to denticles.
MEASUREMENTS (mm) Holotype major: HW 1.58, HL 1.70, SL 0.80, EL 0.18, PW 0.68.
Paratype minor: HW 0.66, HL 0.72, SL 0.74, EL 0.08, PW 0.42.
COLOR Major: brownish yellow except for mandibles, which are light brown, hence darker.
Minor: body brownish yellow, appendages clear medium yellow.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. COLOMBIA: Finca Merenberg, 12 km west of Belén, Huila, 2300 m (C. Kugler and J. Hahn). Scale bars = 1 mm.



Pheidole vomer **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY L *vomer,* plowshare, referring to the raised median carina of the major clypeus.

DIAGNOSIS Similar in various traits to *amata, ambigua, celaena, fera, germaini, peruviana, rutilana, schwarzmaieri,* and *superba,* differing as follows.

Major: median carina projects forward slightly as a single, bladelike process; occipital cleft deep; carinae originating on frontal lobes fan outward and most reach the occipital border; occipital lobes mostly smooth and sprinkled with scattered foveae; in dorsal-oblique view, humerus raised high as a prominent lobe; propodeal spines thin and vertical on propodeal basal face; postpetiole from above diamond-shaped; promesonotal dorsum entirely carinulate.

Minor: head "tiger-striped" with curving carinulae along the sides and straight carinulae that run from the frontal lobes to the occiput; occiput somewhat narrowed, with nuchal collar; promesonotal dorsum entirely carinulate; propodeal spines short, thin, and vertical on the propodeal dorsal face.

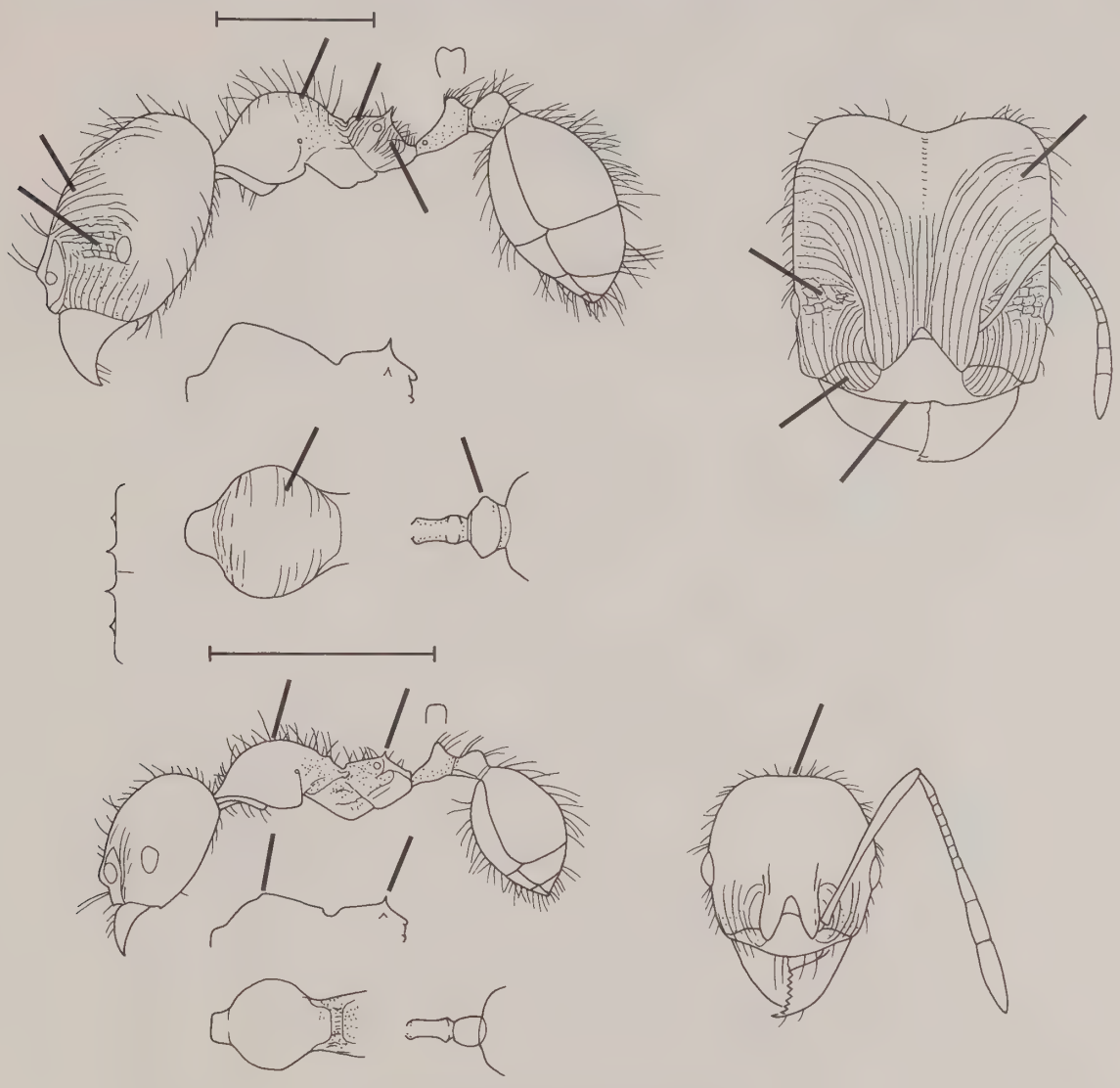
MEASUREMENTS (mm) Holotype major: HW 1.34, HL 1.48, SL 0.70, EL 0.16, PW 0.70.
Paratype minor: HW 0.70, HL 0.78, SL 0.66, EL 0.08, PW 0.48.

COLOR Major: body and mandibles dark reddish brown, tarsi dark yellow, other appendages light reddish brown.
Minor: body medium brown, appendages dark yellow.

RANGE Known from the type locality, and from San Pedro de la Sierra, Pico Verbabuena, Magdalena, 1730 m (C. Kugler).

BIOLOGY Winged queens were present in the type colony at the time of collection 9–13 January.

FIGURE Upper: lectotype, major. Lower: paralectotype, minor. HONDURAS: San Juan Pueblo. Scale bars = 1 mm.



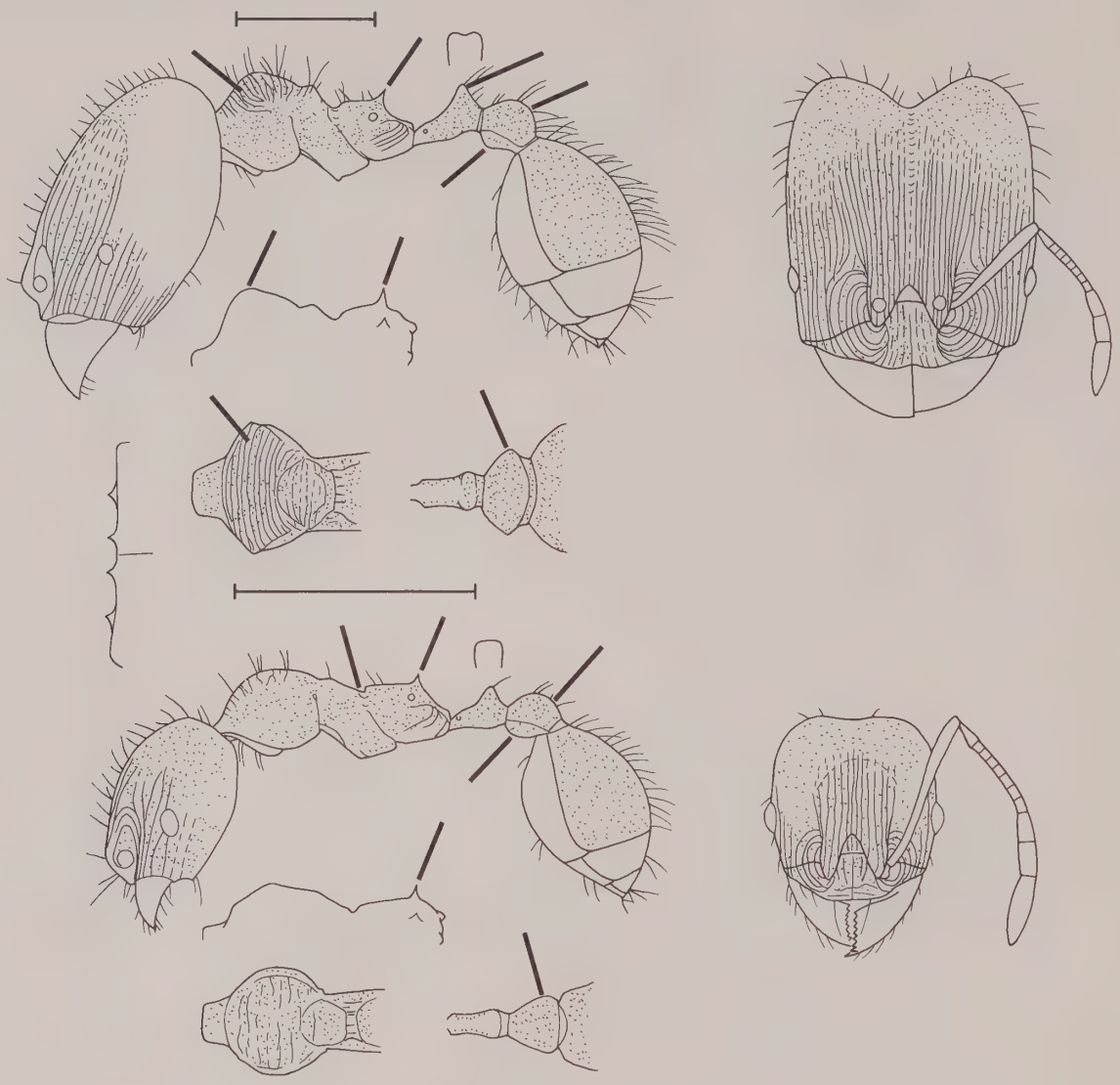
Pheidole walkeri Mann

Pheidole walkeri Mann 1922: 27.

TYPES Mus. Comp. Zool. Harvard.
ETYMOLOGY Eponymous.
DIAGNOSIS A very distinctive member of the *tristis* group, with clypeal structure in early stage of phragmosis.
Major: lateral wings of clypeus projecting forward, creating a semi-phragmotic head; no hairs on clypeus, also an apparent semi-phragmotic trait; frontal lobes projecting and subangulate in side view; carinulae originating in frontal lobes turn posteriorly outward to reach the sides of the head; rugoreticulum extends from eye to rear of antennal fossa on each side of head; margins of pronotum and dorsum of propodeum carinulate; postpetiole from above elliptical.
Minor: occiput narrowed slightly, nuchal collar absent; promesonotal dorsum semicircular in side view, subangulate in dorsal-oblique view; propodeal spines reduced to denticles.
MEASUREMENTS (mm) Lectotype major: HW 1.26, HL 1.38, SL 0.64, EL 0.14, PW 0.68.
Paralectotype minor: HW 0.54, HL 0.60, SL 0.56, EL 0.12, PW 0.34.
COLOR Major: body medium reddish brown except for anterior half of head, which is dark reddish brown; appendages light reddish brown.
Minor: body medium reddish brown, appendages light reddish brown.
RANGE Known only from the type locality.
BIOLOGY Unknown.

Compare with species listed
in the Diagnosis below

FIGURE Upper: holotype, major. Lower: paratype, minor. PERU: Tingo Maria (William L. Brown). Scale bars = 1 mm.



Pheidole zoster **new species**

TYPES Mus. Comp. Zool. Harvard.

ETYMOLOGY Gr *zoster,* belt, girdle, referring to the broad postpetiole.

DIAGNOSIS A large, bicolorous (**major**) or reddish yellow (**minor**) member of the *tristis* group whose **major** has a very large oval-angulate postpetiolar node, prominent subpostpetiolar convexity, dense parallel transverse carinulae covering all of the promesonotum, and completely foveolate and opaque dorsal head surface and first gastral tergite.

Minor: with large, somewhat elongated bell-shaped postpetiole; subpostpetiolar process; short, erect propodeal spines, and completely foveolate and opaque dorsal head surface and first gastral tergite.

Similar to *alpinensis, exarata, excubitor, germaini, grandinodus, grantae, obrima, rogeri, stulta,* and *tristis,* differing in many details of body form, sculpturing, and pilosity, as illustrated, and in color.

MEASUREMENTS (mm) Holotype major: HW 1.64, HL 1.82, SL 0.82, EL 0.20, PW 0.88.

Paratype minor: HW 0.70, HL 0.74, SL 0.68, EL 0.14, PW 0.44.

COLOR Major: head, mesosoma, and petiole reddish yellow; mandibles medium brown; postpetiole and gaster light brown; legs and antennae dark yellow.

Minor: reddish yellow

RANGE Known only from the type locality.

BIOLOGY The nest contained a seed cache and males 9–12 March.

Indeterminate Names

Neither types nor other authoritatively determined material of the following named forms could be located by me or the curators of the collections of original deposit.

Pheidole bahai (Forel 1922b: 91), described as *Tetramorium (Cephalomorium) bahai*

Pheidole delecta Forel 1899e: 67

Pheidole fimbriata var. *tucumana* Forel 1913m: 228

Pheidole floridana var. *deplanata* Pergande 1896: 883

Pheidole gigliolii Menozzi 1935b: 193

Pheidole haywardi Kusnezov 1952d: 88

Pheidole perversa subsp. *richteri* Forel 1909a: 266

Pheidole plebecula Forel 1899e: 68

Pheidole pubiventris var. *foederalis* Borgmeier 1928a: 34

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The form of the citations and the lettering system used to distinguish multiple works by the same author in the same year (e.g. Emery 1894d, 1894f) are the same as those used by Philip S. Ward, Barry Bolton, Steven O. Shattuck, and William L. Brown, Jr., in their comprehensive *A Bibliography of Ant Systematics* (U. of California Publications in Entomology, Volume 116, U. of California Press, Berkeley and Los Angeles, California, 1996). Because not all of the Ward et al. multiple citations are used in the present monograph, yet complete consistency is sought, some letters in the present work are skipped.

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Acknowledgments

I decided in 1985, after completing a series of studies of the ecology and behavior of *Pheidole,* to undertake a taxonomic revision of the New World species. The classification of the genus at that time seemed almost insurmountable, a veritable Mt. Everest of ant taxonomy, with hundreds of poorly described species whose types were scattered throughout mostly European museums, a tangle of trinomial and quadrinomial names of uncertain application, and an unmeasurable backlog of undescribed species. At that time I invited William L. Brown to join me, knowing of his own special interest in this challenging group. Brown had collected and sorted many of the series then available in the Museum of Comparative Zoology, and his advice and encouragement were an added spur to my ambition. Unfortunately, the geographical space between us from Harvard to Cornell Universities, with all the research collection at Harvard, together with Brown's preoccupation with his own favored subfamily Ponerinae, and later, his declining health and finally death in 1997, prevented him from participating further.

The diagnostic drawings of the 624 species—hence all the illustrations except those in the introductory chapter—are entirely by my own hand, but were meticulously inked and thus made ready for publication by Minsheng Wang with the assistance of Xiufen Wang. The Wangs also prepared much of the fresh material used in the collection. I am grateful to Cesare Baroni Urbani, Katherine Brown-Wing, the late Frank M. Carpenter, and Jeanette Wheeler for permission to reproduce some of the figures in the introductory chapter.

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Because I required substantial periods of time to examine and illustrate type and other authentic material of each of the 624 species, months of work in European and South American museums would have been needed had I done the work *in situ*. Given my other duties and projects, that amount of foreign residence would have been all but impossible. I am therefore very grateful to the following curators who, without exception for any museum containing relevant material, sent me all of the types of New World *Pheidole* outside the Museum of Comparative Zoology they could find, which, with the collection already at hand came to include 97 percent of all the validly named species, subspecies, and varieties. (The full addresses are given on page 130.)

American Museum of Natural History, New York, USA	James C. Carpenter and Eric L. Quinter	(part of W. M. Wheeler Collection)
Florida State Collection of Arthropods, Gainesville, Florida, USA	Jim Wiley	(M. Naves Collection)
Instituto Miguel Lillo, Universidad Nacional de Tucumán, Argentina	Abraham Willinck	(N. Kusnezov Collection)
Istituto di Entomologia "Guido Grandi," Bologna, Italy	Maria Matilde Principe	(C. Menozzi Collection)
Museo Civico di Storia Naturale "Giacomo Doria," Genoa, Italy	Valter Raineri	(C. Emery Collection)

Museu de Zoologia, Universidade de São Paulo, Brazil	Carlos Roberto F. Brandão	(T. Borgmeier, W. Kempf, and N. Kusnezov Collections)
Muséum d'Histoire Naturelle, Geneva, Switzerland	Claude Besuchet, Daniel H. Burkhardt, Ivan Löbl, and Bernhard Merz	(A. Forel Collection)
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U.S. National Museum of Natural History, Washington, D. C., USA	David G. Furth, Ted R. Schultz, and David R. Smith	(Diverse collections, including T. Pergande and W. M. Mann)

The scope of the monograph was greatly increased by thousands of nest series made available by entomologists working throughout the range of the New World *Pheidole*—literally from the meadows of New England to the mountain forests and pampas of Argentina. Especially large and fruitful accessions, many from areas never before sampled, were contributed by a small group of dedicated field biologists. William L. Brown, on different occasions accompanied by his wife Doris E. Brown, by Charles Kugler, and by others including members of the Cornell University Mexican Field Trip groups, worked with a keen eye widely through southern Mexico, Central America, Colombia, Venezuela, Brazil, and Argentina. Similarly, in repeated expeditions Stefan Cover made near-exhaustive collections of the *Pheidole* of the southern Arizona mountains, the La Selva Field Station in Costa Rica, and, with John E. Tobin, the extraordinarily rich fauna of Amazonian Peru. Robert Hamton, an "amateur" in name but professional in accomplishment, provided excellent collections from some of the least explored areas of Mexico. Charles Kugler worked tirelessly in what proved to be a mother lode of new and remarkable species in montane Colombia, and especially in the previously unknown Chocó region. John T. Longino, in the course of his pioneering comprehensive survey of the ants of Costa Rica, provided the first clear picture of the *Pheidole* fauna of an entire Neotropical country; his detailed natural history notes have been a welcome bonus for the present monograph. Roy R. Snelling surveyed *Pheidole* intensively in the southwestern United States. Stewart B. Peck, often accompanied by his wife Jarmila Kukalová-Peck, displayed his usual talent in reaching and sampling remote and poorly explored areas and in the case of *Pheidole,* he scored highly in the tropical Andes. James C. Trager similarly ranged widely in South America. Philip S. Ward, in the course of his many other projects in ant systematics and ecology, sampled efficiently from the western United States to the tropical Andes, and also supplied valuable natural history data.

Other collectors cumulatively added a large additional fraction to the *Pheidole* revision material. They have been credited in the appropriate species descriptions, and in some cases further acknowledged by having new species they discovered named in their honor.

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This index includes all the subgeneric, species groups, species, and infraspecies names, both recognized as valid and invalidated, for the New World.

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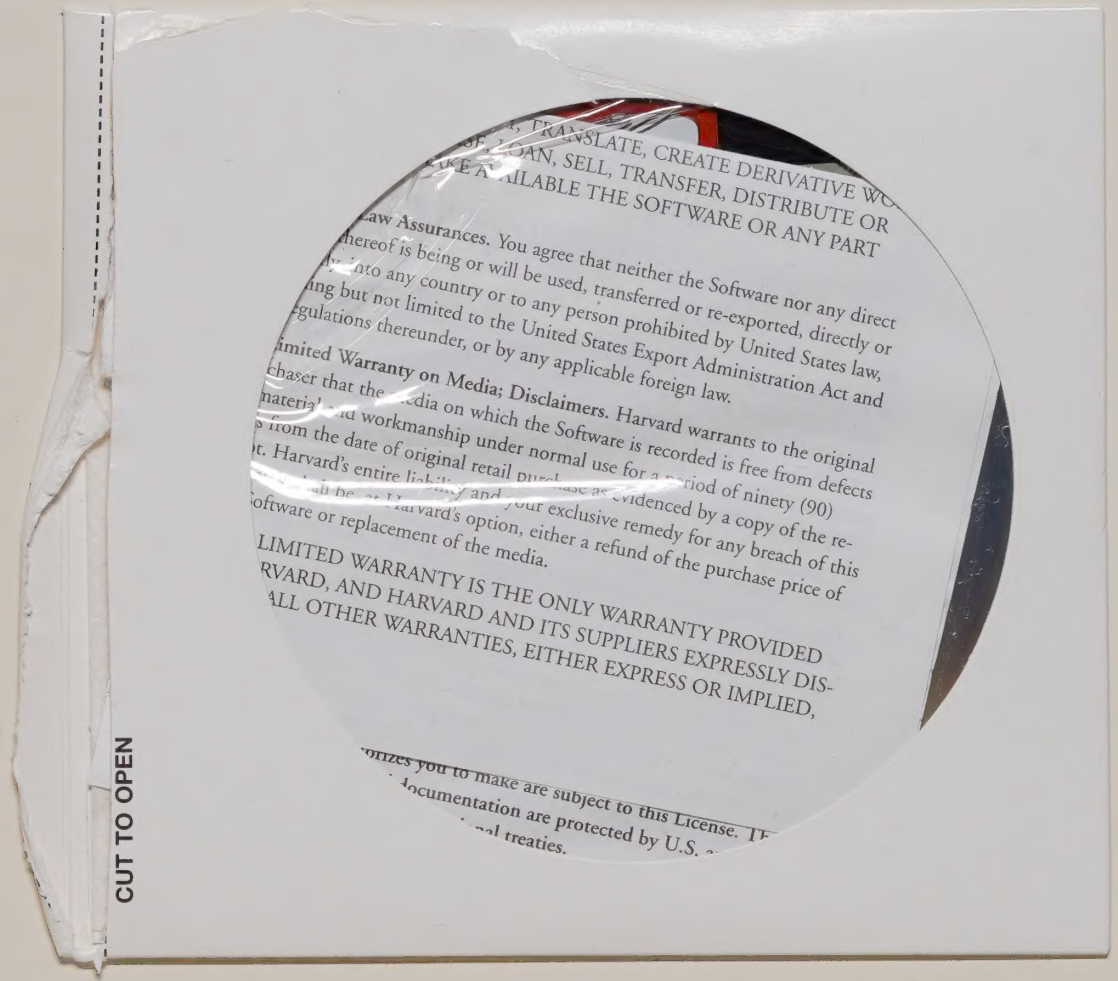

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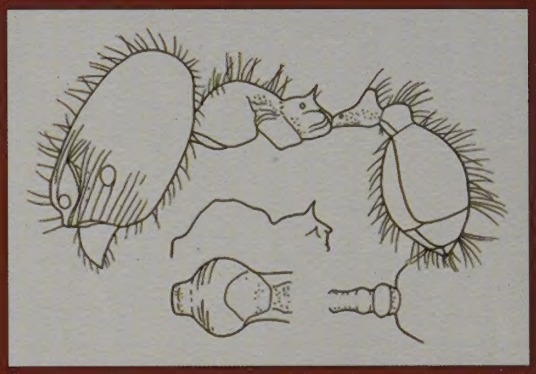
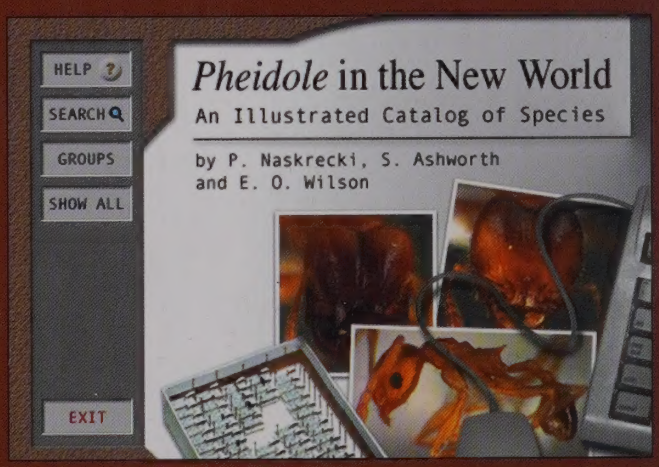
Species of the genus *Pheidole* are the most abundant and diverse ants of the New World and range from the northern United States to Argentina. In this richly illustrated book, Edward O. Wilson untangles its classification for the first time, characterizing all 624 known species, 337 of which are new to science, and ordering them into 19 species groups. The author's keys and drawings, the latter showing complete body views arranged in the style of field books, allow rapid identification by anyone with an elementary understanding of entomology. In presenting all of *Pheidole*, the book covers one-fifth of the known ant species of the Western Hemisphere, including many of the commonest forms.

Wilson also summarizes our knowledge of the natural history of each species, much of it previously unpublished. In addition, he provides a general account of hyperdiversity, confirming that it is not a statistical artifact but a genuine biological phenomenon that can best be understood by detailed analyses of groups of organisms such as the *Pheidole* ants.

An important innovation in this book is the inclusion of a CD-ROM containing high-resolution digital images of most of the type specimens. The CD-ROM is designed to allow quick retrieval of information such as known range, group membership, measurements, and color. Thus the CD-ROM, created by Piotr Naskrecki and Sarah Ashworth, will be useful in constructing "instant" field guides, comparison charts, and local checklists.





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Edward O. Wilson is Pellegrino University Research Professor Emeritus, Harvard University. In addition to two Pulitzer Prizes (one of which he shares with Bert Hölldobler), Wilson has won many scientific awards, including the National Medal of Science and the Crafoord Prize of the Royal Swedish Academy of Sciences. He is the author of many books, including *Biophilia, The Diversity of Life, The Insect Societies, On Human Nature,* and *Sociobiology,* and co-author of *The Ants* and *Journey to the Ants* (all from Harvard).